The Dissertation Committee for Michael Stephen Moode certifies that this is the approved version of the following dissertation:

Can Organizational Communication Strategies that Activate Associations with Mindfulness and Flow Enhance Novel-Idea Production in an Open-Ended Problem-Solving Task?

Committee:

_____
Dawna I. Ballard, Supervisor

_____
Matt McGlone

_____
Larry Browning

_____
Jeffrey Treem

_____
Stephen Cox

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by

Michael Stephen Moode, B.A., M.A.

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DEDICATION

This task would not have been completed without the enduring patience, support and inspiration of my family. To them, this work is dedicated.

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Michael Stephen Moode, Ph.D.

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SUPERVISOR: Dawna I. Ballard

Creativity is the production of solutions to problems that are both original and appropriate. Although organizational communication literature offers insights regarding overt strategies for enhancing creativity at work (e.g., brainstorming rules), processes whereby creativity may be tacitly enhanced remain largely underexplored. Drawing upon creativity's associations with heightened awareness (i.e., mindfulness) and the experience of flow—a psychological state characterized partially by distorted perceptions of the passage of time—the present study considers whether exposure to phrases related to these concepts influence the likelihood of one producing more novel ideas in an open-ended problem-solving task. The pursuit of new, tacit means for enhancing the originality of solutions to problems may benefit organizational communication practitioners in the following way. The creativity of employees may be facilitated

if new tacit means are used (or avoided) alongside extant overt strategies. Employees may be more capable of producing novel ideas in response to a problem-solving task if organizational communication practitioners develop a more nuanced understanding of how the presentation of problems, and the methods used in solving them, exposes employees to incidental and unobtrusive meanings that shape the socio-environmental context in which problem-solving takes place.

The present study used a two-by-two, between subjects factorial design, that presented participants with a set of phrases related to different levels of mindset (i.e., mindfulness and mindlessness) and psychological state (i.e., flow and anti-flow). For example, phrases representing the combination of mindfulness and flow included, "I'm focused," "my goals are clear," "I'm tuned in to my feelings," and "I'm up to the challenge at hand." Exposure to these phrases sought to activate associations with the mindset of actively and fluidly processing social information (i.e., mindfulness) and the psychological state whereby deep concentration leads to the reduction of self-awareness and awareness of the passage of time (i.e., flow). Conversely, phrases representing the combination of mindlessness and anti-flow included, "I'm not focused," "my goals are not clear," "I'm not tuned in to my feelings," and I'm not up to the

challenge at hand." After being exposed to one of four sets of phrases, participants were then administered a novel-idea production task in which they were instructed to produce a list of solutions to a problem (i.e., people driving while using text messaging on their cell phones).

Results of the experiment failed to demonstrate a relationship between the presentation of phrases aiming to trigger associations with mindset and psychological state; however, measures to assess internal reliability suggested that methodological limitations confounded the present study's ability to accurately test how the activation of associations between mindset and psychological state are related to the likelihood of one producing novel ideas. As such, the present study concludes by drawing a number of insights regarding methodological considerations for future investigations. Specifically, recommendations are drawn regarding participant selection, the research milieu in which novel-idea production may be empirically observed, how associations with different mindsets and psychological states may be primed, and how a problem should be presented within an experiment intending to measure novel-idea production. Summarily, the present study represents a valuable starting point for investigators seeking to contribute to an underexplored topic within the organizational communication literature; for explorations of how the

implementation of overt strategies to enhance novel-idea production in organizations may be enhanced by practitioners' attention to whether and how employees are exposed to stimuli which may prime associations with peak creativity.

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PROLOGUE

The value of creativity in organizations is widely accepted (Thompson, 2003). However, despite some notable exceptions (e.g., Eisenberg, 1990; Jablin, 1981; Jablin, Seibold, & Sorenson, 1977; Weick, 1979), organizational communication scholars have not devoted much attention to this topic as an area of investigation. Paucity of research dealing with creativity in organizations is problematic for two reasons. First, the complexity and pace of change in contemporary organizational environments makes it increasingly important for decision-makers and leaders to have an understanding of what is possible in terms of influencing employees' capacity to respond to unanticipated problems in novel and appropriate ways (Cummings & Oldham, 1997; Sternberg & Lubart, 1995; Thompson, 2003). Second, creativity has a restorative effect on organizations—both to individual employees themselves and to organizations as a whole. For organizations to accomplish goals in a fiercely competitive environment, or to survive when an industry is in decline, it is vital that decision-makers and leaders develop a more robust understanding of the relationship between organizational communication and creativity. For organizations to realize the ameliorative effects of creative productivity, organizational communication scholars must develop a more nuanced understanding of how organizational structures and communication processes affect cognition and behavior leading to the production of creative solutions to problems (Csikszentmihalyi, 1996; Doughtery, 1996, 2006; Mainemelis, 2001; Nakamura & Csikszentmihalyi, 2005; Nemiro, 2002; Zhou & George, 2001).

The present study considers whether the presentation of meanings associated with peak creativity might facilitate resistance to normative pressures when one produces ideas to solve an open-ended problem. Can certain types of messages prime patterns of thought that increase the likelihood of one producing novel ideas? Through what message tactics are employees most likely to overcome barriers to creativity (i.e., fear, lack of motivation, reluctance to play; see Jarboe 1999)? Through what message tactics are employees more likely to pursue out-of-the-ordinary or unexpected connections; to solve problems in ways that reflect the search for new possibilities in familiar situations? Under what circumstances are employees more likely to abandon familiar social scripts or cognitive heuristics?

A broad interdisciplinary literature suggests that a variety of overt structural and procedural strategies enhance the likelihood of creativity in organizations. However, an area that extant work has not fully explored is the use of *tacit* strategies to enhance creativity (Mumford, 2000). In the absence of overt structural and procedural strategies, can organizational communication messages increase the likelihood that employees will think and act in ways that lead to more creative solutions to problems? The notion that creativity can be primed has been explored by some researchers (e.g., Cai, Mednick, Harrison, Kanady, & Mednick, 2009; Friedman, Fishbach, Förster, & Werth, 2003; Lewis, Dontcheva, & Gerber, 2011; Sassenberg & Moskowitz, 2005). However, researchers have not sufficiently explored how organizational messages might prime novel-idea production or the range of concepts that might be used to trigger employees' associations with peak creativity. Noticeably absent from prior investigations is an examination of how two concepts associated with peak

creativity may be used to trigger thoughts and behaviors that facilitate the production of novel ideas to solve a problem: *mindfulness* and *flow.*

What is especially interesting about the concepts of mindfulness and flow as concepts associated with peak creativity is their seeming incompatibility. Mindfulness, on one hand, is defined as one's heightened attention to "the content, structure, and sequencing of verbal messages, as well as the paralinguistic cues, gestures, facial expressions, body movements and cues provided by the physical environment that accompany verbal messages" (Bergoon, Berger, & Waldron, 2000, p. 106). Flow, on the other hand is defined as an experience characterized—partially—as a state of attention characterized by one's deep focus on an activity resulting in a shedding of one's sense of self and socially-constructed environmental factors such as the experience of time (Csikszentmihalyi, 1996).

Mindfulness appears to be a mindset primarily associated with interpersonal encounters. With the definition of this mindset focusing on one's attention to verbal and nonverbal behavior and the contextual cues that shape how one perceives meaning, mindfulness is an obvious necessity in the formation and maintenance of workplace relationships. Observing instances of mindfulness in the workplace, one might look to employees effectively cooperating or collaborating with each other; behaving strategically with deference to power differences and the politics of a competitive work environment; or resolving conflicts in ways that affirm dignity and contribute to the overall workplace communication climate. The concept of flow however, does not invoke such images of individuals being as socially attuned. As Mainemelis (2001) observes, the concept of flow conjures imagery of one

experiencing internal ecstatic joy through the investment of the self into a task—*not a relationship*. Flow, as it is associated with creativity, is understood by many through the archetype of the painter toiling away in a remote grotto. Seeking neither fame nor fortune, sustaining the activity is an end unto itself. To engage—or to be interrupted by others—detracts from the profoundly satisfying experience of the work. Contrasting the popular notion of flow being a purely intrapersonal phenomenon, scholars have observed that dyads and small groups can experience periods of *entrainment* in which flow is experienced simultaneously (see Eisenberg 1993; Sawyer, 2003). Workplace experiences exemplifying situations in which employees simultaneously share the experience of flow are those that are analogous to groups masterfully performing improvisational music, theater, and in athletic competition. Such experiences are not shaped by group member's heightened attention to formal structures (i.e., rules and ceremonies) or the interpersonal needs of their fellow group members. Effectiveness in such situations are facilitated by what Eisenberg (1993) describes as "minimally disclosive" communication: highly efficient message sending and receiving behaviors focus almost exclusively on the task at hand.

Creativity appears to involve both mindfulness and flow. How can one *mindfully* attend to verbal messages and cues while simultaneously focusing so deeply on a task that one becomes unconscious of personal and environmental systems of meaning? In practice, as will be discussed in the following chapter, the process of creativity allows for one to experience both states of mindfulness and flow during the stages leading to the presentation of a "finished" creative idea. Yet, at the outset of an open-ended, problem-solving task, how might the activation of associations with both concepts—mindfulness and flow—affect the

likelihood of one producing something novel? If one is exposed to concepts related to peak creativity, is one more likely to initially produce ideas that are novel? Or, do some creativity-associated concepts carry greater power than others to activate one's capacity to "think outside of the box?" For instance, if one is exposed to concepts associated with flow but not mindfulness, is one likely to creatively underperform another who is exposed to concepts related to both flow and mindfulness?

The present study considers the nature of novel-idea production as a facet of creativity. Specifically, this study questions whether organizational communication can enhance the likelihood of one producing novel ideas to solve problems. In the following chapter, a review of the interdisciplinary literature exploring the nature of creativity is presented. This literature review explores the way novel-idea production can be constrained by organizational communication and the strategies scholars have uncovered to overcome this phenomenon. Then, the idea of priming creativity is discussed and linked to the conclusions drawn by several important works—specifically, Csikszentmihalyi's (1996) investigations on the relationship between flow and peak creativity and Langer's (2005) argument that singles out mindfulness as the main element in determining whether or not one is likely to produce work that may be objectively judged as creative. Through this discussion, hypotheses are drawn regarding the way that priming creativity-related concepts affects the likelihood of one producing novel ideas to solve problems. Additionally, the question of how combinations of "mismatched" primes (e.g., *mindlessness* and flow; *mindfulness* and an experience antithetical to flow) influence the likelihood of novel-idea production.

Based on the hypotheses and research questions developed following a review of the creativity literature, Chapter 2 describes the experimental methodology used in this study. Chapter 3 presents the findings of the present study. Chapter 4 concludes this dissertation with a critical discussion of the study's findings which includes directions for continued scholarship on the relationship between organizational communication and novel-idea production.

CHAPTER 1: ORGANIZING FOR CREATIVITY

Why is the creativity of employees in organizations an issue that merits scholarly attention? Lay wisdom and reports of empirical observations suggest that most organizations are places that inhibit creativity. (Amabile, 1992; Amabile, 1998; Robinson, 2006). An essential ingredient of creative thinking is the ability to recognize and avoid obvious, unoriginal responses to problems (i.e., to avoid functional fixedness; see Dunker & Lees, 1945). In the context of work, however, normative pressures born of organizational communication can lead to patterns of thought and behavior that make it challenging for employees to tap their full creative potential, prompting the production of solutions to problems that are (a) appropriate but unoriginal (i.e., conservative realism), (b) original but inappropriate (i.e., creative idealism), or (c) both unoriginal and inappropriate (i.e., conservative idealism; see Finke, 1995). Employees with a high potential for creativity may be unable—or even *unwilling*—to change patterns of thought and behavior that make it possible to look beyond mundane ideas and attend to those that are not merely appropriate but novel as well (Thompson, 2003).

In this chapter, popular assumptions that creativity is inhibited by organizational communication are explored though a systems theory framework (see Weick, 1979; 1995). Then, consideration is given to some of the specific ways that discursive practices in organizations (i.e., interpersonal and group-level talk) may impose barriers on the likelihood of employees producing novel ideas when attempting to solve problems.

Barriers to Creative Problem-Solving in Organizations: A Weickian Approach

A fundamental assumption of organizational communication is that organizations are complex and unpredictable. Employees' workplace behaviors are driven by an implicit need to reduce uncertainty and to accurately interpret information born of the complexity and unpredictability of the work environment (Weick, 1979; 1995). When the meaning or the value of workplace information is unequivocal (i.e., "I know what this means and I know why it is important to me"), employees tend to adhere to *assembly rules.* With assembly rules, communication is highly predictable in terms of both content and form. Employees rely upon over-learned, easily accessible social scripts; thinking about problems and responding to them in ways that are expected, customary, or habitual. Conversely, when the meaning and value of workplace information is equivocal (i.e., "I don't know what this means and I don't know if it is important to me"), employees engage in *communication cycles*. During a communication cycle, assembly rules are temporarily suspended. Ideas that might have previously been rejected on the basis of their novelty are considered. Ideas that might have previously been rejected because they were inappropriate are actively sought. Essentially, during this momentary break in normal organizational communication, employees are prompted to introduce and respond to ideas in ways that reflect a departure from predictable patterns of behavior and thought. Employees are prompted to "put new things in old combinations and old things into new combinations" when they might otherwise prefer to keep old things in old combinations—and leave new things and new combinations alone (Weick, 1979, p. 252).

Approaching organizational communication from a sensemaking perspective, communication cycles—and subsequently creativity—are likely to occur only occasionally (Drazin, Glynn, & Kazanjian, 1999). In the absence of external, environmental stimuli to prompt communication cycles—the frequency of creativity in mature organizations decreases over time (Gómez & Ballard, 2013). Organizations rely upon assembly rules to facilitate "business as usual." Creativity occurs mainly in those exceptional circumstances when the presentation of equivocal information prompts sensemaking; when employees are no longer able to respond to problems in ways that conform to the prescribed order of assembly rules.

Over time, as employees adhere to assembly rules, barriers to creative problem-solving emerge, even despite opportunities for creativity prompted by the uncertainty-reduction goals of communication cycles. Employees experience work through the lens of the organization's collective understanding. When employees encounter something that falls outside of this understanding, a communication cycle is initiated. This interrupts the efficiency and order sustained by adherence to assembly rules. For a moment in the lifecycle of the organization, conditions are right for creativity to occur. However, the search for novel insights beyond the limits of the organization's collective understanding is motivated primarily by the need for sensemaking—not to produce something creative merely for creativity's sake.[1]

[1] This perspective does not presuppose the fact that employees may bring a healthy spirit of curiosity into the workplace and seek out equivocal information that prompts sensemaking. Similarly, an employee's competitive spirit and attention to what other organizations (or divisions within one's own organization) are doing may similarly lead one to seek out information that is equivocal. In these instances, the motivation to create is still most likely to be based on the pursuit of uncertainty reduction and not creativity for creativity's sake (i.e., artistic self-expression). "How might I perform this task more efficiently?" "How might we beat our competition?" "How might I make a good impression on others?" The present study

Once a novel and appropriate insight is found to satisfy the employees' need for uncertainty reduction, the communication cycle ends with *retention* (see Weick, 1979). Collective understanding expands to incorporate new insights. Then, what was only recently perceived as novel becomes ordinary. Social scripts, expectations, customs, or habits are modified to accommodate "the new ordinary" as assembly rules evolve and are observed anew. What may have only recently been a source of wonder or surprise becomes part of employees' mundane, day-to-day work experiences.

On the "island of stability" sought by most employees in most organizations—where inherent complexities and uncertainties are mitigated by a comprehensive set of assembly rules—problems are readily solved with easily-accessible, widely-accepted "correct" solutions. However, the organizational communication practices that lead institutions to this destination may further compound the challenge of creativity in ways that go beyond merely limiting the frequency of communication cycles. As assembly rules are observed over time, norms emerge that shape behaviors and how behaviors are perceived. There are four general ways that communication norms born of adherence to assembly rules are likely to restrict the production of creative solutions to problems.

First and foremost, adherence to assembly rules can normalize senseless conformity. Subsequently, this may lead employees to implicitly uphold values such as "don't rock the boat," or "the nail that sticks out gets hammered." During communication cycles, employees' efforts to solve problems might reflect patterns of groupthink; or, individual employees might communicate in ways

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assumes that these types of questions and the sensemaking that occurs leading to their answers are what initiates the creative process in the workplace; not questions that merely ask, "How can I let my 'freak flag' fly higher?"

consistent with social loafing (Basadur, 1994; Blake & Mouton, 1987; Rawlinson, 1981).

Second, adherence to assembly rules can reify fears about violating rules or having ideas rejected. During communication cycles, fearful employees may be reticent to offer novel suggestions or to question the quality of unoriginal or inappropriate ideas (Basadur, 1994; Johnson, 1993; Miller, 1987; Schuldberg, 1994; Haslett & Ruebush, 1999). Additionally, while an employee may partially overcome fears, offering some novel suggestions, the manner in which this occurs may lack the spontaneity or playfulness that is often necessary to shift from thinking along the lines of organizational norms to thinking in ways that draw novel connections (Basadur, 1994; Byers, 1992; Michalko, 1994).

Third, adherence to assembly rules can normalize communication behaviors that devalue collaboration (i.e., as a rule, employees compete with each other or seek to withdraw from conflicts) or those that foster mistrust between employees (i.e., gossip or workplace bullying). During communication cycles, employees who are unwilling to collaborate or who mistrust one another might be unwilling to share ideas or to put forth the time and effort necessary to consider ideas or make reasoned decisions (Basadur, 1994; Becker, 1994; Miller, 1987; Rooks, 1987).

Fourth, adherence to assembly rules can normalize communication behaviors that negatively influence employees' motivation to engage in creative problem-solving. The likelihood of an individual considering a variety of potential solutions—or the search for novelty—has been tied primarily to intrinsic motivation (Amabile, 1996; Amabile, 1998; Amabile & Conti, 1999; Amable, Conti, Coon, Lazenby, & Herron, 1996; Amabile, Hadley, & Kramer,

2002). External pressures that attempt to affect intrinsic motivation (e.g., messages that prescribe that a task be put off until later or that a task be completed immediately) have been found to constrain creativity (Bare & Oldham, 2006). During communication cycles, employees who take for granted the importance of intrinsic motivation or erroneously assume that extrinsic motivation tactics enhance creativity, may inhibit the likelihood of producing creative solutions.

To summarize the preceding discussion, modern organizations have been characterized as complex and unpredictable. Behaviors in organizations aim to reduce the uncertainty resulting from these characteristics. As a result, most of what happens in organizations in terms of communication conforms to what Weick defines as assembly rules—highly predictable, patterned behaviors that attempt to deal with the uncertainty employees experience as a result of a complex and unpredictable workplace environment. Occasionally, when an assembly rule is not suited to deal with a problem, employees engage in communication cycles—a deviation from normal patterns of organizational communication in which an institution's need for constraint is balanced against a need for creativity.

Communication cycles—opportunities for creativity in organizations—occur as the exception to normal behavior. In the absence of situations that prompt new communication cycles, assembly rules can become so comprehensive that the necessity of creativity and employees' ability to solve problems creatively begins to fade. With new assembly rules, fewer and fewer problems fall outside of the organization's collective understanding. Over time, the adherence to assembly rules can normalize communication behaviors that

inhibit creativity beyond merely decreasing the frequency with which it occurs. Employees may needlessly conform to organizational norms despite circumstances that demand "abnormal" responses. Employees experience fear of the thoughts and behaviors that are necessary to produce novel ideas during communication cycles. Employees that normally distrust one another bring their broken interpersonal relationships into conversations where the need for trust is paramount. Employees that take for granted experiential factors that are at the heart of creativity communicate in ways that inadvertently stifle the creative potential of their co-workers.

Concluding this section of the chapter, it appears as though a Weickian perspective confirms the lay belief that stable, mundane organization inhibits creativity. Following this approach to the relationship between creativity and organizational communication, it would seem that creativity is—at best—not a phenomenon to be routinely expected with much frequency in the mature organization. Subsequently, it may come as little surprise to the organizational communication scholar when a once successful organization fails to keep up with its competition, or maintain its foothold within an industry it once dominated because of a deficit of novel ideas or the will to act upon them. Even when there are ample signals indicating that a competitor has produced an innovation or that an industry has changed, the normal, expected response is often insufficient to deal with these circumstances. Organizational communication leading up to the production of novel ideas is, by its very nature, prohibitive of the kinds of strange, weird—*wonderful*—ideas that allow forward movement.

It may similarly come as little surprise when a once successful employee fails to effectively contend with an unusual problem at work (i.e., a problem that is "practical" and work-related, or interpersonal in nature) as a result of excessively relying upon assembly rules and the communication norms born of their practice over time. Even when the out-of-the-ordinary nature of a situation could not be clearer, breaking out of the comfort of a familiar routine may be an insurmountable challenge for even the most competent employee.[2] How might organizational communication promote structures and behaviors that enable employees individually and in groups to overcome normative pressures that inhibit creative thought and action in these situations? How can workplace experiences be designed to counter *normal, expected* tendencies for employees to contend with the challenge of thinking and behaving in ways that produce novel ideas? In the next section of this chapter, the nature of creativity is further explored and organizational communication strategies to facilitate the production of novel ideas are reviewed.

Enhancing Creativity in Organizations

Eisenberg, Goodall and Trethewey (2007) argue that organizational communication is a process of balancing opposing needs for constraint and creativity. As suggested by the previous discussion, organizations are complex and unpredictable. More often than not, communication produces structures that constrain behavior, providing certainty as a counterpoint to the chaos one might experience in the absence of structure. Subsequently, tipping the balance in favor of supporting creativity—breaking out of adherence to assembly rules—poses a

[2] The inability to deal with the unfamiliar as one becomes entrenched in workplace habits may be closely related to the principle described by Lawrence Peter of employees "rising to their level of incompetence"—the Peter Principle (see Peter & Hull, 1969)

special challenge. In those instances when employees' ability to produce novel, appropriate solutions to problems is essential, normative pressures resulting from inevitable and necessary organizational communication processes that normally constrain thoughts and behaviors must be overcome. Even when the manner in which a problem is presented highlights a pressing need for novelty, employees' efforts to engage problems in ways that produce novel ideas are impeded. How can organizational communication practitioners restructure workplace experiences in ways that enhance the likelihood that employees overcome normative pressures that inhibit the production of novel ideas? How can communication cycles be enhanced to optimize employee's creative potential?

Below, the nature of creativity is further explored, drawing specific attention to ways in which employees' thoughts and behaviors contribute to the novelty of ideas. Then, a review of organizational communication strategies that purport to enhance creativity is also offered. [3]

The Creative Process in Organizations

Creativity is most simply defined as the process whereby novel and appropriate ideas are produced by individuals, teams; or through the collective effort of groups that make up an organization (Mumford, 2003; Sternberg, 2011). Novel ideas are those that are perceived as unusual or uncommon. Conversely,

[3] As Meusberger (2009) observes, there is considerable divergence in scholarly attempts to define the nature of human creativity. Beyond agreeing that creativity involves the production of novel, useful ideas, the only other contention on which there is widespread scholarly consensus is that creativity is complex. Acknowledging this complexity, this review focuses primarily upon strategies to facilitating creativity in organizations that deal with communication behaviors at interpersonal, group, and organizational levels of analysis. As such, this review omits works that link creative performance to *intrapersonal* factors such as personality and intelligence, group composition factors (i.e., diversity of groups), and societal factors (e.g., Florida's 2002 *Rise of the Creative Class* links creative ability to the economies in which individuals live and work).

common ideas are those that are perceived as expected or conforming to custom or habit (Thompson, 2007; Woodman, Sawyer, Griffin, 1993). Appropriate ideas are those that are perceived as correct, proper, or ethical in the context in which they are produced (Woodman, Sawyer, Griffin, 1993). Whether or not ideas are either novel or appropriate depends largely upon the judgment of gatekeepers within the work environment (e.g., supervisors, managers, and key stakeholders). As such, creativity involves not only the generation of novelty and appropriateness, but the *presentation* of ideas in ways that meet the approval of others within a social system (Csikszentmihalyi, 1996).

Extended definitions of creativity characterize this phenomenon as a complex process encompassing the interplay of multiple factors at multiple levels of analysis (George, 2007; George & Zhou, 2007). Woodman, Sawyer, and Griffin (1993, pp. 312-314) articulate one of the most widely cited theoretical frameworks that partially accounts for the complexity of creativity in organizations. They contend that:

> …the creative performances of individuals in a complex social setting [are] a function of salient individual characteristics, social influences that enhance or constrain individual creativity (e.g., group norms), and contextual influences that enhance or constrain individual creativity (e.g., organizational reward structure)….the creative performance of groups in a complex social setting is a function of the creative performance of group members, salient aspects of the group itself that enhance or constrain creativity (e.g., size), and contextual influences on group functioning (e.g., organizational culture)….[and] the creative performance of the organization, as a complex social system, is a function of the creative performance of its constituent groups, and salient aspects of the organization that enhance or constrain creativity (e.g., resource availability).

Amabile's (1996) framework of creativity depicts how individual creativity occurs as a cognitive and behavioral process involving four discrete stages. The production of novel, appropriate ideas is the result of a process encompassing (a) problem presentation, (b) preparation, (c) response generation, and (d) response validation. Although these stages are presented in this order, in practice, they occur iteratively, non-sequentially, and over indeterminate lengths of time (Amabile, 1996; Csikszentmihalyi, 1996; Nemiro, 2002).

Stages encompassing the creative process are influenced by at least one of three components: (a) domain-relevant skills, (b) creativity-relevant skills, and (c) task motivation. Domain-relevant skills encompass the scope of thoughts and behaviors that delineate one domain of work from another (e.g., brain surgery involves different skills than designing a vehicle to go to the moon), enabling individuals to understand tasks and understand the viewpoint of the domain's gatekeepers who validate the originality and appropriateness of ideas. Creativity-relevant processes encompass the thoughts and behaviors that enable the individual to break down a task, to apply or suspend cognitive heuristics and scripts to produce a response, and to recognize the potential for novelty and appropriateness. While domain-relevant processes distinguish one domain of work from another, creativity-relevant processes determine the extent to which domain-specific criteria for novelty or utility are met, acting as a set of "executive controllers" that shape behavior during stages of creative thinking and behavior (Amabile, 1996, p. 93). Task motivation encompasses the scope of internal and external variables that shape attitudes towards engaging problems or tasks (Amabile, 1996).

According to Amabile (1996), in the first stage of the creative process one becomes aware of a problem as a result of either internal insight or an external presentation (i.e., a co-worker asks for help in solving a puzzle). According to Amabile (1996, p. 95), the component of *task motivation* is primarily responsible for shaping thought and behavior at this stage. "If the individual has a high level of intrinsic interest in the task, this interest will be sufficient to engage the process. Under these circumstances, the individual, in essence, poses the problem to himself [sic]." In circumstances in which a task or problem is presented that one does not at first find interesting, extrinsic pressures centering upon the urgency of an activity and the scarcity of time can motivate one to engage in creative action (Bare & Oldham, 2006). However, "when people are primarily motivated to do some creative activity by their own interest and in enjoyment of that activity, they may be more creative than they are when primarily motivated by some goal imposed on them by others" (Amabile, 1996, p. 15).

In the second stage of the creative process, one engages a problem or task by accumulating and/or reactivating domain-relevant knowledge and cognitive scripts or schemas for generating solutions or responses. For example, a person might concentrate on past experiences in an effort to remember something that was previously learned or conduct research to learn about something new. The component of domain-relevant processes shape behaviors at this stage as one actively learns or remembers skills or knowledge necessary for one to perform within a domain of work (Amabile, 1996).

In the third stage of the creative process, potential solutions or responses are generated through interplay between internal cognitive processes (i.e.,

divergent and convergent thought; see Thompson, 2003) and attention to relevant external social-environmental features (i.e., the context in which an idea is likely to be judged as either appropriate or inappropriate). Drawing upon research dating back to the earliest modern investigations of creativity (see Guilford, 1950), as the number of potential responses increases, the potential for categorical flexibility and originality (i.e., statistical rarity) of ideas increases. Essentially, as the individual considers more ideas, it becomes more likely that he or she will be able to look beyond those which are obvious or mundane (Amabile, 1996; Thompson, 2003). According to Amabile (1996), response generation is shaped by both the components of creativity-relevant processes and task motivation. On one hand, the component of creativity-relevant processes shapes how potential responses are generated with respect to the requirements of the task or problem at hand. Of critical importance to the relationship between creativity-relevant processes and response generation is one's capacity to apply cognitive heuristics and scripts that allow the temporary suspension of critical judgment regarding the potential appropriateness of ideas. This, in turn, contributes to fluency as it accommodates consideration of strange or unrealistic ideas that, while ultimately failing to meet the criterion for appropriateness, prompt the subsequent discovery of related, similarly strange ideas that—in fact—do meet this criterion (Amabile, 1996; Thompson, 2003). On the other hand, the component of task motivation facilitates response generation by determining the extent to which this third stage is sustained as one generates many potential responses (Amabile, 1996; Csikszentmihalyi, 1996).

In the fourth and final stage of the creative process, a response is tested against domain-specific criteria in terms of its novelty and appropriateness.

While a domain's field of regulatory gatekeepers have an influence on all stages of the creative process (see Csikszentmihalyi, 1996), they play an especially prominent role in this stage. Gatekeepers represent the special segment of people who observe the production of an idea and validate the individual's claims regarding its novelty and appropriateness. In organizations, gatekeepers include experts and other authority figures (i.e., managers or other individuals who can wield influence over a social system). At this stage, domain-relevant techniques of analysis are applied as the individual uses the symbols of a domain of work (i.e., the specialized terms that one learns as one masters a work-related skill) to present an idea to the field of gatekeepers who ultimately decide if it is creative (Csikszentmihalyi, 1996).

Thus far, this chapter has examined the nature of the creative process, considering specifically how an employee thinks and behaves in the pursuit of creative solutions to problems. Moreover, this section has considered how socio-environmental "components of creativity" (i.e., task motivation, domain-relevant skills, and creativity-relevant skills) influence each stage of this process. Continuing this chapter, attention is now directed to some of the overt strategies to enhance creativity in organizations.

Overt Strategies to Enhance Creativity

A large interdisciplinary literature informs our understanding of the nature of creativity and approaches to enhance it at the individual, group, and organizational level of analysis. A cross section of these approaches is reviewed below. This is not a comprehensive review of all of the ways that employee creativity may be enhanced in the workplace, but a sampling of works that represent some of the distinct ways employees and managers may design

workplace experiences to overcome normative pressures that inhibit the production of novel ideas. These strategies to enhance creativity encompass (a) different ways of *structuring the creative process, (b)* establishing *communication rules*, (c) *leadership*, and (d) *technology.*

Structuring the creative process. According to Jarboe (1999), a trend that resonates throughout the creativity literature is a focus on the procedures that individuals and groups use to engage tasks creatively. Works representing this trend argue that when employees are presented with opportunities to produce novel ideas, communication should be structured by a set of procedures that guide thought and behavior through stages of problem presentation, presentation, response generation, and response validation. Arguably the earliest work representing this approach was Dewey's (1910) model for individual reflective thinking. Following this model, individuals focus effort on defining and analyzing a problem and establishing criteria for evaluating the quality of solutions, generating many solutions, and selecting and implementing solutions. Closely related to Dewey's (1910) reflective thinking approach is Wallas's (1926) approach which described a four stage model in which an individual engages in preparation, incubation, illumination, and verification. An interesting distinction between these two early approaches is that Dewey's (1910) approach relied heavily on the idea of using the scientific method to develop solutions to problems, framing creative problem-solving as a highly rational, systematic process of observation, hypothesis generation, and testing. Partially rejecting a reliance on rationality, Wallas's (1926) approach placed emphasis on the "non-rationality" of creative thought; the intuition involved in producing novel ideas that an individual may have difficulty articulating or reproducing from one

instance to the next. The *incubation* stage of Wallas's (1926) model prescribed that employees *walk away* from a problem—to *dream* on it for awhile—before consciously attempting to produce and test solutions.

Jarboe (1999) presents a concise review of some of the subsequent attempts to develop procedures that enhanced Wallas's (1926) approach balancing rational and "non-rational" aspects of creative problem-solving. For example, modifications to this approach by Rawlinson (1981) introduces an *effort* stage to the model; Kao (1991) introduces stages involving *interest* and *exploitation* of ideas. Hurst et al (1989) developed an approach consisting of seven stages encompassing imagination, motivation, planning, action, evaluation, satisfaction, and realization. Kuhn (1988) presents a model that involves multiple incubation stages. Essentially, the scope of works representing a focus on procedures that attempt to enhance creativity have aimed to heighten employees' attention to the significance of thoughts and behaviors relative to the stages and components of creativity; directing attention away from a focus upon communication behaviors born of adherence to assembly rules. Research assessing the efficacy of procedures that groups use to solve problems provides some empirical evidence to support claims that when individuals experience an incubation stage, the likelihood of producing novel ideas increases; when individuals do not experience this stage, the likelihood of producing novel ideas decreases (Smith 1995; Ward 2003). Essentially removing the possibility of one walking away from a problem for a while results in a fixation on relatively semantic categories of ideas. Attention to other things while a problem is put aside affords one exposure to different experiences, and thus different semantic categories of ideas. Through one's relaxation of focus on a task, links between two previously

unrelated semantic categories of ideas may be drawn serendipitously, affording insight that can contribute to the production of a novel solution to a problem.

Communication rules. While some works prescribe general structures for the creative process as a whole, another area within the creativity literature prescribes rules for communication during specific stages of the creative process—particularly within the idea generation stage. Quite possibly the most widely known of these works is Osborn's (1957) brainstorming rules. Proposed originally as an approach to be used by advertisers to come up with original ideas for advertising campaigns, Osborn's (1957) brainstorming rules emphasize idea generation without evaluation (Basadur, 1994). When following brainstorming rules, employees are encouraged to come up with as many ideas as possible, to refrain from criticizing ideas, and to pursue opportunities to combine seemingly unrelated ideas and to use previously shared ideas to produce more. While empirical tests of the efficacy of brainstorming rules suggest that groups that observe such rules are more likely to outperform groups that do not, researchers have found that brainstorming rules alone are insufficient to enhance creativity. For example, apprehensiveness (see Diehl & Stroebe, 1987; Jablin, Seibold, & Sorenson, 1977), thoughts of losing ownership of ideas shared to a group (see Harkins & Jackson, 1985), and time pressure (see Kelly & Karau, 1993) counteract the positive influence of brainstorming rules.

Other communication rules that have been presented as routes to enhance creativity attempt to push thought and behavior well outside of what may be considered normal according to an organization's assembly rules. One example is a technique called mindboggling. According to Vance and Deacon (1995, p. 164), mindboggling is "a deliberate attempt to blow our minds out of the box."

Drawing upon research examining the efficacy of strategies such as lateral thinking (see de Bono, 1967), reframing (see Watzlawick, Beavin, & Jackson, 1974), and random-word technique (see de Bono, 1992), mindboggling rules attempt to take brainstorming to an extreme as participants are deliberatively *provocative*. Another set of techniques, specifically the lotus blossom technique (see Tatsuno, 1990) and visual group confrontation (see Geschka, 1993) impose communication rules requiring members of groups to consider ideas presented visually (i.e., listing ideas using diagrams) and to engage in idea generation tasks accompanied by music.

While structural approaches presented thus far in this section prescribe behaviors that attempt to encourage communication during problem-solving, the last two sets of structures reviewed next are interesting in that, while encouraging communication to a degree, they also impose limits in terms of when members of a group are permitted to communicate and through what channels: the nominal group and Delphi techniques. Nominal group technique (see Delbecq, Van de Ven, & Gustafson, 1975) prescribes independent idea generation—members of a group initially do not share their ideas with each other. Only after a required period of independently generating their own ideas, group members then share and develop ideas at the group level. Rules that govern the discussion call for group members to take turns sharing ideas until all ideas are shared, to seek clarification about ideas without offering criticism, to rank-order ideas in order of preference, and rely on voting to make final decisions (Jarboe, 1999). Delphi technique (see Delbecq et al, 1975) similarly imposes restrictions on group member interaction, requiring ideas to be shared through anonymous written questionnaires. Research on the efficacy of these

methods suggests that, in imposing some barriers to communication, the quantity and quality of ideas produced in response to problems can be enhanced (Delbecq et al, 1975, Erffmeyer & Lane, 1984; Herbert & Yost, 1979; White, Dittrich, & Lang, 1980; Miner, 1979).

Leadership. Creativity researchers have examined how the behaviors of leaders within an organization (i.e., team leaders, supervisors, managers, owners, etc.) influence the likelihood of employees producing creative solutions to problems. This research goes beyond strategies of transformative leadership which deal broadly with the idea of employees learning and changing as a result of experiences with leaders. Instead, this literature deals more with how leader-employee interactions impact employee's abilities to draw upon components of creativity—particularly *task motivation*. Miller (1987) observes that norms born of adherence to assembly rules can socially condition employees to respond to problems in ways they think will please team leaders, supervisors, managers, and so on. Additionally, leaders themselves should consider how their own adherence to assembly rules reinforces norms that stifle creativity. Badawy (1987; cited in Jarboe, 1999, p. 349) argues that leaders in the workplace who are most likely to support the creativity of their employees avoid twelve behaviors that can kill a team's creativity: "[a] drag your feet, [b] say 'yes,' but do not do it, [c] wait for a full analysis, [d] do not follow up, [e] call many meetings, [f] put the idea into channels, [g] boost the cost estimates, [h] wait for market surveys [i] stick to protocol, [j] worry about budget, [k] lack a sense of urgency, and [l] if a good idea isn't yours, don't push it."

Beyond alerting leaders to avoid creativity-stifling norms, the literature further prescribes that leaders should engage in behaviors that support what

Kanter (1988) describes as "kaleidoscopic" thinking. Such behaviors encompass behaviors and task structures that motivate employees to question traditional assumptions that underlie assembly rules, communicate a vision of what is possible when opportunities for creativity are seized, and encourage persistence and teamwork (Jarboe, 1999).

More nuanced approaches recognize that specific abilities leaders bring to the organization influence their capacity to enhance or constrain employee creativity. For example, Zhou and George (2003) observe that the potential for leaders to influence employee creativity during communication cycles is often held in check by previously existing tensions, conflicts, and strong emotions. As such, the emotional intelligence of leaders—something which leaders can cultivate over time—plays a crucial role in helping employees resolve these problems; redirecting their focus on sources of intrinsic motivation and the application of domain- and creativity-specific skills.

Beyond an attention to norms and skills that leaders bring, the literature suggests that the very presence or absence of leaders has an effect on employee creativity. For example, Zhou (2003) shows that when employees with high creative ability are present in a group setting, high group creativity is more likely when leaders engage in fewer supervisory behaviors (e.g., facilitating idea generation discussions, expressing a vision for the future, setting goals, encouraging discussion, setting limits on the task; see Cox & Moode, 2008). When employees with low creative ability are present, high group creativity is more likely when leaders let their presence be known, by engaging in more supervisory behaviors. Essentially, the creative needs of the organization may, in

some situations, be served by the presence of leaders; other times, it may be best for a leader to step out of the way.

Overall, the literature on the relationship between leadership and creativity deals with how leaders serve both the needs of the organization as a whole and the needs of individual employees. As such, the literature places a great deal of responsibility on leaders for maintaining the all-important balance between an organization's needs for creativity and constraint (see Eisenberg, Goodall, and Tretheway, 2007).

Technology. Over the past few decades organizations have experienced a shift in the nature of standard organizational arrangements favoring greater decentralization, autonomous decision-making structures, project oriented work, and virtual organizing. This shift is partially attributed to advances in the *information communication technologies* (ICTs) that support such arrangements (e.g., social networking and group decision support systems; Crampton, 2001; Huber, 1990; Scott, 2003; Thompson, 2003; Towers, Duxbury, Higgins, & Thomas, 2006; McPhee & Zaug, 2000; Nemiro, 2002). Unsurprisingly, a bourgeoning area of the creativity literature has considered how the affordances of different types of ICTs may be used to facilitate employee creativity in organizations (Dewett, 2003; Jarboe, 1999; Liu, Bonk, McIntyre, & Magjuka, 2008; Nemiro, 2002; Yang & Lee, 2006).

Few topics have received as much recent attention in the organizational communication literature as the relationship between ICTs and organizing (DeSanctis & Monge, 1999). Popular beliefs have emerged regarding the power of new technologies to facilitate creativity (Dewett, 2003). Some of these beliefs have been empirically tested, suggesting new ways in which organizations may

tap employees' creative potential through the adoption of certain information communication technologies and special procedures for their use.

In a study of how employees use virtual teams to solve problems, Nemiro (2002) finds that ICT-mediated communication conforms to patterns of behavior predicted by Amabile's (1996) stage-based componential model of creativity. When employees engage in problem-solving using ICT channels, Dewett (2003) argues that systems governing ICT channels may be designed to better facilitate employee experiences related to components of creativity (e.g., task motivation, domain- and creativity-relevant skills). For example, systems may be designed to insulate employees from distractions that inhibit task motivation, to sequence interactions according to creative procedures (i.e., facilitating creativity-relevant skills), and to enhance access to domain-relevant information. Although Nemiro (2002) and Dewett (2003) acknowledge that technologies intended for information management (e.g., database, document management, storage, and retrieval systems) can help individuals develop both domain-relevant and creativity-relevant capacities over the long run, neither addresses how the use of technologies intended for human-to-human interaction may filter-in or filter-out messages that tacitly prompt creative thought and behavior as members of groups collaboratively engage a task or problem[4]. Recognizing this oversight, the following summary of the present discussion on overt strategies to enhance creativity in organizations moves the focus of this chapter to the idea that employee creativity may be influenced by tacit means; that the content and form

[4] The idea that social information may be filtered in or filtered out in communication is prominent in works considering technology's role in shaping interpersonal communication. The apparent absence of perspectives considering technology's capacity to filtering in or filtering out social information as a potential means to influence creativity played a large part in prompting the present study's focus on tacit approaches to enhancing creativity and the work of Human Intelligence Workers as the milieu in which data were gathered.

(i.e., channels) of organizational messages may have an effect on the way one engages the creative process.

Narrowing the Research Problem Field: Are Overt Strategies Enough?

Based upon Amabile's (1996) model of creativity, creativity appears to be a process involving special, deliberate effort. This effort may be facilitated by interventions that design workplace experiences so that employees approach problem-solving in ways that enhance connections between socio-environmental components (i.e., domain-relevant skills, creativity-relevant skills, and task motivation) and discrete stages of creativity (i.e., problem presentation, preparation, response generation, and response validation). Empirical research suggests that by adopting these approaches encompassing organizational structures, communication rules, leadership behaviors, and technology, barriers to creativity born of adherence to assembly rules might be mitigated. Yet as critics of the creativity literature often observe (see Jarboe, 1999), approaches to enhancing creativity—more often than not—tend to fail.

The failure of many of these approaches to consistently enhance creativity may be partially due to their overt nature. Viewed through a Weickian systems framework, if strategies for enhancing creativity are imposed on employees outside of a communication cycle—during periods when assembly rules appear to be serving employees' needs well—the mere novelty of these approaches might lead them to be automatically dismissed. Additionally, because thought and behavior during communication cycles may be shaped by communication norms that adhere to assembly rules, employees may view new strategies for organizing with skepticism even despite their awareness of a need for change.

While overt strategies may represent part of an answer to the question of how organizational communication practitioners design the workplace to facilitate creativity, it should certainly not be viewed as the entirety of what may be done. Looking beyond overt strategies, the final section of this chapter changes its focus to consider *tacit* strategies to enhance creativity. In the absence of overt strategies to enhance creativity, can employees be influenced to produce creative solutions through means of which they are unaware?

Tacit Strategies to Enhance Creativity: Priming Novel-Idea Production

An underlying assumption of the present study is that overt strategies to enhance creativity represent only a partial answer to the question of how workplace experiences can be designed to increase the likelihood of creative problem-solving. An essential missing ingredient is attention to the ways that thoughts and behaviors related to creative problem-solving can be *tacitly influenced* by organizational communication. Specifically, this section turns its attention to the question of whether organizational message strategies can be used to *prime* thoughts and behaviors that facilitate (or constrain) novel-idea production. Can an employee's exposure to certain words or phrases in predictably alter thoughts and behaviors in ways that promote the production of novel ideas? As Cox and Moode (2008) suggest, at the outset of a problem-solving task, managers may seek to enhance employee creativity through messages that encourage participation, grant employees decision-making autonomy, create a sense of ownership of the problem, and create a fun and comfortable atmosphere. In creating these meanings, however, can managers use language (and exercise control over the words employees are exposed to in the work environment) in ways that enhance creativity leading to and during a

communication cycle? Is a manager's use of a phrase such as, "this will be a fun project" more or less likely to stimulate novel-idea production compared to a phrase such as, "this will be a routine project"?

An Introduction to the Concept of Priming

Priming refers to the incidental or unobtrusive activation of social knowledge that influences one's state of awareness, thought or behavior (Bargh, 2006). Priming effects refer to the relatively stable, predictable outcomes (i.e., thoughts or behaviors) that occur as a result of priming. Current scholarship in priming may be traced to psychology research conducted by Meyer and Schvaneveldt (1971; see also Schvaneveldt, Meyer, & Becker, 1976). In their investigations, subjects were presented with two strings of letters that were composed of different combinations of words and non-words (i.e., random strings of letters). In one experimental condition, subjects were asked to respond "yes" or "no" if the strings made up words. In another condition, subjects were asked to respond, "same" if both strings made up words; or "different" if the letters didn't make up words. As hypothesized by the researchers, subjects' associations with the concepts of "sameness" or "differentness"—activated by the directions provided by the researcher—interfered with their ability to correctly identify different sets of letters that either made up words, or sets that did not. In this case, subjects were primed to think in a manner that was counterintuitive to the nature of the task; subsequently, the time it took to correctly identify whether or not two strings of letters contained words was much longer for subjects in the second experimental condition than in the first.

Another important test of priming effects was conducted by Bargh, Chen, and Burrows (1996). In this experiment, subjects in one condition were exposed

to sets of words associated with stereotypes for the elderly (e.g., Florida, lonely, sentimental, bingo, etc.). Subjects in a control condition were exposed to neutral words. After being presented with these words, the speed with which subjects walked was measured as they left the laboratory area where the priming words were presented. Results of this experiment demonstrated that subjects who were exposed to the words associated with the elderly changed the speed with which they walked—moving in accordance with the stereotype that the elderly walk more slowly.

A variety of stimuli encompassing sensory information (i.e., things that one sees, hears, smells, tastes, or touches), symbols, or concepts can be used to cause priming effects related to (a) the speed with which one processes information (Mayr & Buchner, 2007; Reisberg & Snavely, 2010; Neumann & DeSchepper, 1991), (b) one's ability to draw connections between related semantic categories (Biederman & Cooper, 1992; Vaidya et al, 1999), (c) the likelihood one repeats ideas or behaviors (Forster & Davis, 1984), and (d) one's motor behaviors (Klotz & Wolff, 1995; Klotz & Neumann, 1999; Vorberg et al, 2003; Schmidt & Vorberg, 2006). In a 2006 review of priming research, Bargh (pp. 147-168) notes the ubiquity of priming phenomena.

> Nearly all forms of social representation can be primed, it seems—activated incidentally or unobtrusively in one context, to influence what comes next without the person's awareness of this influence….We know that such effects are ubiquitous and pervasive across the major forms of psychological phenomena: appraisal and evaluation, motivation and goal pursuit, social perception and judgment, and social behavior.

Connecting the concept of priming to the present study's focus on enhancing creativity in organizations, this introduction to priming concludes

with a brief review of works that have sought to prime creative thinking. First, Sassenberg and Moskowitz (2005) define social stereotyping behavior as antithetical to creativity. When one relies upon stereotypes, one uncritically attributes qualities to an individual based upon the individual's membership with a group. To overcome stereotyping, one must break out of this pattern of thinking and consider attributions that do not fit one's stereotype for a social group. In their experiment, Sassenberg and Moskowitz (2005) developed a method in which subjects were primed to avoid relying upon stereotypes by being exposed to the words "think different" before being presented with images of people representing different race groups.

While Sassenberg and Moskowitz's (2005) study frames stereotype suppression as a form of creativity, subsequently priming subjects to avoid stereotypes by exposing them to words that directly invoked the concept of creative thought (i.e., "think different"), other investigations have attempted to prime creativity using words or phrases that, while associated with the concept, are not synonyms of "creativity." For example, a study by Dennis, Minas and Bhagwatwar (2014) relates the concept of creativity to *achievement*. Using a word sorting activity, one set of experimental subjects was primed using words associated with achievement (e.g., win, honor, aspire, etc.). Control subjects were exposed to neutral terms. After being primed by words associated with achievement or the neutral prime, subjects were then given a novel-idea production task. Subjects exposed to the achievement primes produced more creative ideas than those exposed to the neutral prime.

As another example, a study by Lewis, Dontcheva and Gerber (2011) links creativity to associations with positive mood. In one experimental condition,

subjects were primed to have a positive mood by being exposed to certain images (e.g., a laughing baby, a puppy, a dessert, etc.). A second experimental condition exposed subjects to images associated with a neutral mood (e.g., shoes, an umbrella, a hammer). A third experimental condition exposed subjects to images associated with a negative mood (e.g., an oil spill, the effects of a natural disaster, a homeless person). After being primed, subjects were then administered a novel-idea production task. Subjects exposed to the positive mood prime outperformed subjects exposed to either the neutral or negative mood priming conditions.

As a final example, a study by Friedman, Fishbach, Förster, and Werth (2003) links the concept of creativity to the literal physical act of looking beyond one's field of vision. Specifically, the researchers associated creative performance with attention to what is in the periphery of one's sight. Conversely, uncreative performance was associated with one looking straight ahead. Their study involved a series of experiments, using purpose-built display equipment in which subjects were primed through the presentation of visual stimuli presented within either a broad (i.e., periphery) field of vision or a narrow field of vision. Subjects primed in the broad field of vision conditions outperformed subjects primed in the narrow field of vision conditions on novel-idea production tasks that followed visual priming.

Priming Creativity through Associations with Mindfulness and Flow

Researchers have studied the idea of priming creativity by using a variety of concepts. Indeed, the complexity of creativity invites consideration of a considerable range of concepts which might trigger associations that enhance the likelihood of creative problem-solving. Yet, despite the range of concepts that

researchers have used to prime creativity in extant works, two concepts are noticeably absent from the part of the priming literature that is concerned with creativity: *flow* and *mindfulness*. In this final part of the chapter, these concepts are introduced and considered as the means for activating novel-idea production.

The concept of flow. Scholars' understanding of the nature of creativity has been particularly influenced by investigations that explored creativity's relationship to flow—or, a heightened state of intrinsic motivation.

> Csikszentmihalyi [1996] was struck by the fact that when work on a painting was going well, the artist persisted single-mindedly, disregarding hunger, fatigue, and discomfort—yet rapidly lost interest in the artistic creation once it had been completed. Flow research and theory had their origin in a desire to understand this phenomenon of intrinsically motivated, or autotelic, activity: activity rewarding in and of itself (*auto* = self, *telos*= goal), quite apart from its end product or any extrinsic good that might result from the activity [Nakamura & Csikszentmihalyi, 2005, p. 89].

Investigations of flow center upon the experiences of individuals who engage in a wide range of task activities including playing strategy games (e.g., chess), athletic activities, performing arts, surgery and others; activities that are distinguished by the salience of intrinsic rewards "where the extrinsic rewards of money and prestige could by themselves justify participation" (Nakamura & Csikszentmihalyi, 2005, p. 89). Yet, when one experiences flow, the ability to sustain involvement in the activity that produced this state is of far greater importance than any thrill of accomplishment that might be realized in the activity's completion. For most people that compete in marathons, for example, the chief motivation to engage in this activity is not in the prospect of winning. Indeed, the vast majority of people that compete in these contests knowingly

have no chance of this. Just as Mallory sought to conquer Everest, "because it's there," it is the incremental progress towards the finish line one recognizes as one step follows the last that motivates one to embark in this enterprise. So long as one is able to focus on the intrinsic motivation to keep going, the "runner's high" may be sustained—and pain and fatigue are largely ignored.

Regardless of cultural, gender, and age variables, individuals' optimal experiences in performing tasks are uniformly characterized by the state of flow, whereby:

> Perceived challenges, or opportunities for action, that stretch (neither overmatching nor underutilizing) existing skills; a sense that one is engaging challenges at a level appropriate to one's capacities…[and one perceives] clear proximal goals and immediate feedback about the progress that is being made.

Moreover, investigations consistently reveal that these experiences are distinguished by individuals' intense concentration on their involvement with the task in the present moment; merging action and awareness (i.e., perceiving immediate feedback from within the task) which results in a *timeless* experience (see Mainemelis, 2001; 2002). In the "timeless intensity of the present moment," individuals lose their sense of self while simultaneously feeling deeply in control of their actions from which ecstasy and joy are derived (Mainemelis, 2001, p. 548).

While central to the optimal performance of relatively mundane tasks (e.g., mowing the lawn), the reduced sense of self-awareness that is born of one's experience of flow acts as a *gateway* to creative productivity; a means of overcoming self-imposed constraints such as one's fear of deviating from group norms, or having one's ideas rejected (see Jarboe, 1999). Losing one's attention to

the self—and group and organizational barriers to creative productivity—fosters interactions between conscious and sub-conscious processes (George, 2007; Jarboe, 1999; Mainemelis, 2001), and group-level and organizational factors that are theorized to enhance creativity (Csikszentmihalyi, 1996; Woodman, Sawyer, & Griffin, 1993). Referencing the work of May (1994), Mainemelis (2001, p. 552) observes that

> Creativity cannot be understood only as a function of talent [or] as an instrumental phenomenon where a final product or goal completely guides one's actions. Rather, creativity depends on the intensity of the direct encounter of people with their work: their experience of unity with and complete absorption in their work.

This oblivious absorption in one's work facilitates the individual's interactions among (a) antecedent conditions (i.e., the situation that necessitates the creative tasks), (b) social and contextual influences (e.g., extrinsic motivation, group norms, and leadership, etc); (c) conscious and subconscious cognitive processes (e.g., intrinsic motivation, ideation, incubation, evaluation, etc.), (d) personality, (e) prior knowledge, and (f) task behavior that leads to the generation of ideas that may be perceived by others as useful and new (Csikszentmihalyi, 1996; Woodman, Sawyer, & Griffin, 1993). Flow enables individuals to transcend the "overwhelming amount of information" their conscious minds are presented within the moment-to-moment reality of their days, "freeing [them] from complete subservience to the dictates of genes and culture" (Nakamura & Csikszentmihalyi, 2005, p. 91). Sustaining flow "requires that attention be held by this limited stimulus field. Apathy, boredom, and anxiety—like flow—are largely functions of how attention is being structured at a given time" (Nakamura & Csikszentmihalyi, 2005, p. 92). As Mainemelis (2001)

theorizes, interruptions can take many forms in terms of interpersonal or group communication. Just as one's shifting attention can end one's experience with flow, so too can communication with others. Individuals are thus able to enter and sustain the experience of flow through the manipulation of variables encompassing antecedent conditions, and social and contextual influences. They enact *separation* behaviors (see Ballard & Seibold, 2003) to establish personal spaces that reduce distractions which impede upon entering and sustaining flow. They enact symbolic "rites of passage" that structure the work environment in ways that facilitate focus on a task (i.e., routine, repetitive tasks that act as a "warm up" for more challenging activities, for example, sharpening pencils; see Mainemelis, 2001).[5]

Csikszentmihalyi's (1996) seminal work on the relationship between flow and peak creativity provides considerable evidence to support claims that the experience of flow and the production of creative solutions to problems are likely to go hand-in-hand. It thereby stands to reason that words and phrases associated with this state are likely to have a priming effect on the way one

[5] Flow is a function of how one's attention is structured at any given moment—and that communication can detract one's attention from focusing upon the task that produces this psychological state. This assertion should not be taken to mean that flow is only experienced by an individual working in isolation from others. As Eisenberg (1990) and Sawyer (2003) have argued, a group members working together can experience flow. This is exemplified by groups engaging in improvisational music, theater, and athletic competition. Communication in these instances occurs, yet as Eisenberg (1990) observes, it reflects an intensely efficient focus on the task at hand. Improvisational jazz performers send may send signals to one another within the performance of a piece of music that communicate who may take a lead, when to change tempo, or whether to change a key. This behavior, however, tends to be minimally disclosive. A performer that speaks out mid-song offering commentary to the group (e.g., "hey guys listen to me, I've got a great idea I think you'll all like to here.") takes the group's attention away from intensely experiencing the present-moment off of the activity, breaking individual group members' experience of flow. The ability for group's to experience flow comes as the result of group members developing communication norms and practices that are parallel to the strategies individuals engage in to experience this state (e.g., separating from non-group members and performing a largely symbolic warm up routine). As Sawyer (2003) argues, the process whereby a group develops this ability to experience flow comes through practice; and through the development of interpersonal variables (e.g., trust and certainty) as group members invest in one another over time.

engages a problem-solving task. Put simply, one is more likely to engage in patterns of thought and behavior that lead to the creation of novel ideas to solve a problem if primed by flow-related words and phrases such as, "my goals are clear," "I'm up to the challenge at hand," and "I'm not stuck in a boring routine." One is less likely to produce creative solutions to a problem if primed by words and phrases representing a state that is antithetical to flow ("anti-flow") such as "my goals are not clear," I'm not up to the challenge at hand," and "I'm stuck in a boring routine."

Rather than merely priming flow, the present study further considers the possibility that simultaneously priming different concepts related to creativity may yield interesting results that further illuminate the nature of creativity. As such, this discussion shifts its attention below to consider how priming effects associated with flow may be enhanced or constrained by the simultaneous presentation of priming stimuli associated with another equally important concept for creativity: *mindfulness*.

The concept of mindfulness. As Csikszentmihalyi (1996) and other researchers of creativity (see George, 2007; Jarboe 1999) widely acknowledge, the creative pursuits of even the most individualistic entrepreneurs cannot exist in a vacuum. As Jarboe (1999, p. 336) observes, "Many of today's creative endeavors occur in group settings. Groups and teamwork are now recognized as essential to organizational growth and development…whether they are short-term 'virtual' teams or long-term 'professional' teams." It is, therefore, not surprising that a sizeable segment of the creativity literature places its focus upon the construct of *mindfulness.*

Mindfulness occurs as a function of interactions contextualized by (a)

novel situations, (b) novel communication channels, (c) interruptions, (d) conflict, (e) competition, (f) confusion, (g) when negative consequences of a message are anticipated, (h) when time delays are perceived in communication, or (i) when one perceives a discrepancy between one's expectations and one's actual experience (Burgoon, Berger, & Waldron, 2000; Langer & Moldoveau, 2000; Sternberg, 2000). Mindfulness entails one's attention to "the content, structure, and sequencing of verbal messages, as well as the paralinguistic cues, gestures, facial expressions, body movements and cues provided by the physical environment that accompany verbal messages" (Bergoon, Berger, & Waldron, 2000, p. 106). It represents a heightened state of consciousness by which information is actively and fluidly processed, facilitating an individual's ability to recognize the multiplicity of socially-constructed realities. Mindfulness is caused by earnestly engaging in "strategic, flexible and/or reason-based (as opposed to emotion based)" communication; behaviors that are routinely demonstrated when one effectively answers challenging questions, develops accurate expectations about others, and communicates persuasively (Burgoon, Berger, and Waldron, 2000, p. 106). Put simply, Langer and Moldoveau (2000, p. 1) define mindfulness as "the process of drawing novel distinctions." The authors continue:

> It does not matter whether what is noticed is important or trivial, as long as it is new to the viewer. Actively drawing these distinctions keeps us situated in the present. It also makes us more aware of the context and perspective of our actions than if we rely upon distinctions and categories drawn in the past. Under this latter situation, rules and routines are more likely to govern our behavior, irrespective of the current circumstances, and this can be construed as mindless behavior [Langer & Moldoveau, 2000, pp. 1-2].

Investigations of mindfulness have demonstrated its significance as a communication construct in contexts pertaining to personal health, the effectiveness of business organizations, and learning in educational environments (Langer & Moldoveau, 2000). Individual experiences in these contexts are enhanced through the consequences of mindfulness: (a) heightened sensitivity to one's environment, (b) greater openness to new information, (c) one's development of new perceptual categories or schemas, and (d) enhanced awareness of the complexity of problems.

Research on mindfulness by Langer and others suggest that mindfulness enhances one's ability to engage the creative process (Langer, 2005). According to Langer, the experience of flow alone cannot be said to contribute to the production of creative outcomes if one's thought and behavior does not lead to the *recognition* of something that can be potentially novel. If one does not recognize the novelty in what one thinks or does, creativity cannot be said to occur regardless of how enjoyable emersion in an activity is.

Traditional orientations to creativity and problem-solving are consistent with perspectives highlighting mindfulness's importance to creative productivity. For example, Dewey's (1910) *Reflective Thinking Method* implicated the importance of mindfulness in defining stages of problem-solving in terms of (a) defining problems, (b) establishing criteria by which desired solutions are recognized, (c) developing potential solutions to problems, and (c) selecting the best one based upon criteria. Similarly, Wallas's (1926) model of creative thinking (i.e., preparation, incubation, illumination, and verification) places a majority of emphasis on relatively mindful activities—how individuals prepare for creative

problem-solving, discovery, and validation—compared to the minority emphasis on relatively mindless activities entailing incubation whereby one does not attend to the creative task (Runco, 1999).

Contemporary approaches to enhancing creativity (e.g., lateral thinking, reframing, random-word technique, mindboggling, etc.; see Jarboe, 1999) decidedly implicate mindful practices, encouraging individuals to actively recognize and suppress behaviors that stifle the production of novelty (e.g., verbal and non-verbal messages that indicate judgment or preference for ideas during ideation processes). Constituting a significant portion of the creativity literature, these works make a compelling case that creative productivity is principally born of strategic communication between individuals, distinguished by flexible cognitive schemas and scripts and an emphasis on rationality—not just through individuals' intersubjective experiences of flow. Mindfulness facilitates the recognition of novelty that is critical to producing creative solutions to problems (Burgoon, Berger, and Waldron, 2000; Langer & Moldoveanu, 2000).

Based upon this review of the nature of mindfulness, several phrases are assumed to trigger associations with this concept. Specifically, "I'm focused," "I'm tuned in to my feelings," "I understand why I feel the way I do," and "I'm tuned in to how other people feel." Conversely, phrases are predicted to trigger associations with mindlessness are "I'm not focused," "I'm not tuned in to my feelings," "I don't understand why I feel the way I do," I'm not tuned in to how other people feel."

Incompatible concepts? The literature's distinct positions related to flow and mindfulness may appear—on the surface—quite contradictory; comprising

yet another instance of creativity scholars' failure to find common ground (George, 2007; Jarboe, 1999). However, upon closer examination, these perspectives may actually describe vital parts of a broader whole that encompass the complex phenomenon called human creativity.

Mindfully attending to others or transitioning into the state of flow—intensifying focus to such an extent that one is removed from the experience of time—depends largely upon communication that alters cognition and one's affective state (Bergoon, Berger, & Waldron, 2000). Communication encompassing separation behaviors and symbolic rites of passage (see Mainemelis, 2001) are likely to facilitate individual experiences of flow. On the other hand, deliberate efforts to communicate with others in novel situations, by means of novel channels; during interruptions, conflict, or competition; or in times of uncertainty give rise to mindfulness. Both forms of communication and the respectively decreased or heightened levels of attention are instrumental to the creative processes (i.e., problem presentation, preparation, response generation, and response validation).

Investigations of creativity in different task domains throughout history indicate that most instances of creative achievement did not occur in flashes of inspiration (George, 2007). Even in instances when serendipity played a part in artistic or scientific discovery, the history of creative achievement highlights the importance of antecedent, contextual, and social factors that situated discoverers and inventors in the right places at the right times. These factors are shaped and reshaped by processes that take place over extended periods, echoing Thomas Edison's sentiment that invention is 99% perspiration (George, 2007) or Nikola Tesla's claim that the perfection of his inventions when first tested was due to the

considerable time he devoted to forming their designs in his own mind. Within the span of time encompassing the scope of a creative endeavor, there is room for both periods of mindfulness and flow (Sawyer, 2003).

On one hand, creativity depends upon attention to the nature of a problem and preparing oneself for the work of developing a solution. Attention must also be devoted to the appropriateness of criteria used to evaluate solutions, and the methods and procedures by which potential solutions are developed and evaluated. Subsequently, attention must be devoted to one's relationships with others—specifically building the necessary spaces of separation that facilitate creative work (e.g., in improvisational music and performance, there is a need for boundaries that allow each performer space and time to contribute to the group effort; to avoid instances in which members of a group "step on each others' toes"; see Sawyer, 2003). These aspects of creative problem-solving may be best facilitated by mindfulness.

But, creativity also depends on flow. When one's attention is "relaxed," one is optimally suited to perform tasks that entail the minutia of a creative enterprise; for example, gathering materials to research a problem; synthesizing disparate ideas from research documents; making a list of potential criteria by which a solution may be evaluated; writing down ideas for potential solutions; incubating ideas by letting one's attention wander to other, non task-related things, etc. Optimally focusing upon these tasks facilitates the production of novelty, one's recognition of the novelty that was produced, and the presentation of a potentially creative idea to others (Sawyer, 2003). As such, a fundamental assumption of the present study is that optimal creative problem-solving involves one experiencing *cycles* of both flow and mindfulness. Either

mindfulness or flow alone are insufficient to the effectiveness of a creative enterprise. Just as Amabile (1996) argues that the stages of the creative process occur iteratively in a non-linier fashion, so too is there an ebb and flow in the way mindset and psychological states are activated over the course of time leading to the completion of a problem-solving task.

To summarize this part of the discussion, the present study assumes that the actual experience of mindfulness and flow are integral to one's capacity to engage the creative process. Additionally, as suggested by the literature, the activation of creativity-related concepts via priming can enhance creativity. As such, the present study proposes the following hypotheses:

- **Hypothesis 1.** Ideas produced in response to an open-ended, problem-solving task are more likely to be novel if an individual is primed by words and phrases associated with the combined concepts of flow and mindfulness.
- **Hypothesis 2.** Ideas produced in response to an open-ended, problem-solving task are less likely to be novel if an individual is primed by words and phrases associated with the combined concepts of anti-flow and mindlessness.

Mismatched Concepts? Csikszentmihalyi (1996) and other scholars argue that creativity is associated with the experience of flow. While Langer's (1996) examination of creativity builds upon much of what Csikszentmihalyi argues about the nature of peak creativity, her framework places considerable importance on the experience of mindfulness—a state of awareness that, while not wholly incompatible with flow is distinguished by one's attention to the creation of meanings in one's socio-contextual environment. Given flow's

connection with the experience of timelessness—a state in which socio-contextual meanings fall outside the realm of one's immediate attention—the present study contends that these states are distinct. They are, however, not incompatible. Given the different stages of creativity and the different combinations of socio-environmental components that facilitate thought and behavior at each stage (i.e., domain-relevant skills, creativity-relevant skills, and task motivation), the present study hypothesizes that, if one is presented with stimuli that primes both flow and mindfulness at the outset of a problem-solving task, one is more likely to produce novel ideas to solve an open-ended problem.

But what would be the priming effects of "mismatched" concepts? For example, if at the outset of an open-ended problem-solving task, one is primed by words related to flow and mindlessness, or words related to anti-flow and mindfulness, how might this affect the likelihood of one producing novel ideas? Do words and phrases associated with peak creativity have a greater influence on one's thoughts and behaviors than those associated with the struggle to create? As no prior work has considered the priming effects of mismatched primes, the present study aims to explore the following research questions:

- **Research Question 1**. What are the priming effects of words and phrases associated with the combined concepts of mindlessness and flow?
- **Research Question 2.** What are the priming effects of words and phrases associated with the combined concepts of mindfulness and "anti-flow."

Organization of the Remainder of this Dissertation

The remainder of the present study is organized as follows. Chapter 2 details methods and procedures used to test this study's hypotheses and explore its research questions. Chapter 3 presents results of the present study, presented and summarized within the framework of the hypotheses and research questions presented in this chapter. Chapter 4 concludes this dissertation with a summary of its findings, a critical discussion of the outcome of the present study with recommendations for additional and related areas of investigation.

CHAPTER 2: METHOD

The present study sought to determine whether the presentation of phrases associated with peak creativity can have an influence on the likelihood of one producing novel ideas in an open-ended problem-solving task. As outlined in the previous chapter, the present study's hypotheses are as follows:

- **Hypothesis 1**. Ideas produced in response to an open-ended, problem-solving task are more likely to be novel if an individual is primed by words and phrases associated with the combined concepts of flow and mindfulness.
- **Hypothesis 2**. Ideas produced in response to an open-ended, problem-solving task are less likely to be novel if an individual is primed by words and phrases associated with the combined concepts of anti-flow and mindlessness.

In addition to the two hypotheses, the present study sought to consider how words and phrases representing mismatched concepts affected the production of novel ideas. Specifically, the present study poses the following questions:

- **Research Question 1**. What are the priming effects of words and phrases associated with the combined concepts of mindlessness and flow?
- **Research Question 2**. What are the priming effects of words and phrases associated with the combined concepts of mindfulness and anti-flow?

This chapter details the two-by-two, between subjects factorial design experiment that was used to test the present study's hypotheses and explore its research questions.

Participants

Participants in this study were "human intelligence workers" employed as independent contractors from the Amazon Mechanical Turk (MTurk) crowd-sourcing marketplace. Launched in 2005, the MTurk crowd-sourcing marketplace has become a resource for individuals and businesses to coordinate large groups of people to perform tasks that computers are incapable of completing (e.g., selecting photographs, writing and proofreading webpage content, identifying artists performing on music tracks, etc.). Among MTurk's approximately 100,000 workers, approximately 21,000 are designated by Amazon as "Masters", for producing consistently high-quality work on human intelligence tasks (HITs) offered by clients using this system. Participants for this study were recruited among this sub-set of workers; specifically those MTurk Masters based in the United States, with at least a 95% approval rating for completed assignments, and having completed at least 500 HITs.

This group was believed to be suited for this study because of the nature of workers' day-to-day work experience. Specifically, working on HITs involves a good deal of repetition and the use of relatively "uncreative" skills (i.e., listening to an audio recording and transcribing its content word-for-word, checking public records to determine the accuracy of information on a website, and proofreading text for grammar). Because MTurk workers are paid a fixed rate by clients for the completion of a task, completing tasks quickly is a prime goal—especially for the sub-set of MTurk workers recruited for this study who, in some cases, depend on completing HITs for their income. As such, the present study aimed to introduce an opportunity for creative work amidst a stream of activity where producing novel ideas is not the norm. In such a context, where

the appropriateness of ideas is valued over novelty, completing tasks quickly is a key goal, and workers are not explicitly trained in techniques for increasing creativity.

An MTurk Human Intelligence Task was created that sought 300 participants. The advertisement for this HIT was displayed only to qualified Human Intelligence Task Workers. This advertisement appeared among a set of other, unrelated tasks that they could elect to complete or ignore. The advertisement described the task as "a study about how the way we use language affects problem-solving." Workers were informed that they would be compensated $2 for completing the task; paid by the researcher. Based on the length of time it took for participants to complete the task, MTurk automatically calculated the effective hourly rate for the task and displayed it to prospective participants. This amount was about $7.88 (on average, participants took about 15 minutes to complete the entire task).

Procedures

Upon electing to complete the HIT, participants clicked on a link within the MTurk system that directed them to a website created within Qualtrics, an online survey management system. The first webpage participants viewed introduced the study and provided documentation regarding informed consent per the rules specified by The University of Texas at Austin Institutional Review Board. A copy of the introduction to the study and consent forms is provided in the Appendix.

After providing informed consent, the next webpage participants were shown contained the priming stimuli that were intended to affect the likelihood of participants producing novel ideas. Participants were presented with one of

the four combinations of phrases representing the concepts of (a) mindfulness and flow, (b) mindlessness and flow, (c) mindfulness and anti-flow, and (d) mindlessness and anti-flow. To facilitate this experimental component of the study, the Qualtrics webpage was designed to randomly assign each individual participant to one of four different versions of the priming task so that each version of the priming task was presented to the same number of participants.

The priming task directed participants to read aloud one of four sets of seven phrases, based on the priming condition to which they were automatically assigned. These phrases were composed by the researcher based upon Langer's (2005) and Csikszentmihalyi's (1996) respective descriptions of the concepts of mindfulness and flow. Table 1 depicts how these phrases appeared within Qualtrics along with the text instructing participants to say them out loud.

Table 1: Priming Statements for The Four Experimental Conditions

Directions [for all conditions]: Read aloud each of the following statements:	
[Condition 1: Mindfulness & Flow] ▪ I'm focused. ▪ My goals are clear. ▪ I'm tuned in to my feelings. ▪ I'm up to the challenge at hand. ▪ I understand why I feel the way I do. ▪ I'm not stuck in a boring routine. ▪ I'm tuned in to how other people feel.	[Condition 2: Mindlessness & Flow] ▪ I'm not focused. ▪ My goals are clear. ▪ I'm not tuned in to my feelings. ▪ I'm up to the challenge at hand. ▪ I don't understand why I feel the way I do. ▪ I'm not stuck in a boring routine. ▪ I'm not tuned in to how other people feel.
[Condition 3: Mindfulness & Anti-Flow] ▪ I'm focused. ▪ My goals are not clear. ▪ I'm tuned in to my feelings. ▪ I'm not up to the challenge at hand. ▪ I understand why I feel the way I do. ▪ I'm stuck in a boring routine. ▪ I'm tuned in to how other people feel.	[Condition 4: Mindlessness & Anti-Flow] ▪ I'm not focused. ▪ My goals are not clear. ▪ I'm not tuned in to my feelings. ▪ I'm not up to the challenge at hand. ▪ I don't understand why I feel the way I do. ▪ I'm stuck in a boring routine. ▪ I'm not tuned in to how other people feel.

After reading each set of statements aloud, participants were instructed to create a brief list of words or phrases that came to mind as they read each statement. Participants were given the suggestion, "Think of some specific time in which all of these statements were true for you; or, imagine the kinds of circumstances under which all of these things might be true for a person." In creating their lists, participants were asked to provide more than one response (i.e., "a list must include at least two items"). The purpose of this open-ended question was twofold. First, responses to this question sought to verify that

participants had actually read the priming statements; to reduce the likelihood of skipping past this part of the study. Second, responses to this question would be content analyzed to determine whether or not the statements triggered patterns of thought consistent with the concepts they were intended to prime.

After being exposed to the priming statements and providing brief responses, all subsequent parts of the study were the same for all participants. First, participants were presented with a new webpage containing an open-ended problem-solving task. Directions on this webpage were adapted from the Alternative Uses task used in the Torrance Test of Creative Thinking (Torrance, 1974) and other similar instruments that attempt to measure novel thinking ability (see Davis, 2004). Specifically, participants were instructed to use their imagination to solve a problem; to see how many interesting, unusual, and clever ideas they could create. Participants were instructed to come up with ideas that were based in reality; however, they were told not to limit their thinking based on how much ideas would cost or whether they would be easy to implement. The problem they were asked to respond to was to come up with a list of ideas to solve the problem of people texting while driving. Responses to this section of the experiment would be the primary means of measuring whether the priming statements in the previous section had an effect on novel-idea production.

Second, participants were presented with a set of 25 statements and asked to indicate on a 5-item, Likert scale the degree to which they agreed with each. These statements sought to determine the degree to which the concepts of mindfulness or flow were activated. Items one through nine were based on the Langer Mindfulenss scale (see Haigh, Moore, Kashdan, & Fresco, 2010); items ten to 25 were based on Mainemelis's (2005) scale of timelessness, which measures

this construct according to four dimensions: *immersion*, *time distortion*, *mastery*, and *transcendence*. The statements used to measure experiences of mindfulness and timelessness are presented in Tables 2 and 3. Although the statements in the first part of the experiment sought to prime either flow or its antithesis, a flow scale was not used in this section of the experiment because the researcher found scales of mindfulness and flow to be quite similar in terms of underlying constructs. However, a key distinction between these constructs, as discussed in the previous chapter, centers upon the experience of time. When one experiences flow, a key aspect of this experience is the perceived distortion or loss of time. This timelessness is not emphasized as a main characteristic of the experience of mindfulness. As such, a scale that focused extensively on timelessness was selected. The purpose of this part of the study was to test for internal reliability; to determine if any patterns associated with increased or decreased novel-idea production could be attributed to participants' exposure to the priming task at the beginning of the experiment.

Table 2: Mindfulness Scale Items
▪ I like to investigate things. ▪ I am always open to new ways of doing things. ▪ I "get involved" in almost everything I do. ▪ I am very creative. ▪ I attend to the "big picture." ▪ I am very curious. ▪ I try to think of new ways of doing things. ▪ I like to be challenged intellectually. ▪ I like to figure out how things work.

Table 3: Timelessness Scale Items	
Immersion	▪ All my attention is invested in my work. ▪ I concentrate intensely in my work. ▪ I am completely absorbed in my work. ▪ I am deeply immersed in my work.
Time Distortion	▪ I lose track of time. ▪ I feel that time stops. ▪ I lose all sense of time. ▪ I am not aware of the passage of time.
Mastery	▪ I feel in command of my work. ▪ I feel in complete control of my work. ▪ I get a great sense of control over what I am doing. ▪ I have a feeling of mastery.
Transcendence	▪ I feel that I am contributing to something larger than me. ▪ I feel that my work is a vehicle for a greater cause. ▪ I feel part of a larger purpose. ▪ I feel that I am contributing to something larger than my organization.

Third and finally, subjects were asked to provide demographic information; specifically, the year they were born, their gender and the highest level of education that was completed. This information was sought in order to

report any statistically relevant results stemming from such variables and to identify limitations of the study due to unintended sampling biases.

Content Analysis

Qualitative data gathered from the first and second open-ended questions (i.e., words/phrases associated with priming statements, and ideas to solve the problem of texting while driving) were content analyzed (see Krippendorf, 1980; Neuendorf, 2002). Words and phrases provided in response to the first question were subjected to a process of open coding, or the process of "breaking down, examining, comparing, conceptualizing, and categorizing data" (Strauss & Corbin, 1990, p. 61). This process involves the constant comparison (see Glaser & Strauss, 1967) of participants' responses in an effort to identify themes that distinguish how responses generated by participants within one experimental condition differ from those of participants in the other conditions.

Words and phrases provided in response to the second question were analyzed using a method developed by Torrance and his colleagues for judging the novelty of responses to open-ended problem-solving tasks (see Davis, 2004). This method considers three factors to then assign participants a score for novel-idea production. First, the fluency of participants' responses was considered, or how many ideas each participant offered in total. Second, the flexibility of participants' responses was considered, or the categorical diversity of each participant's ideas (i.e., a high score of flexibility indicates that a participant's ideas represented multiple, different categories of thought; a low score of flexibility indicates that a participant's ideas fit into relatively few or one category). Third, the originality of participant's responses is considered, or the statistical rarity of each idea. Based on the frequencies with which certain

categories of ideas were represented within the whole data set, ideas were rated as either common, unusual (represented by only 5% of the data or less), or original (represented by only 1% of the data; see Davis, 2004). Each participant was given a score for novel-idea production based on the following formula:[6]

$$\text{fluency} + \text{flexibility} + \frac{\text{originality}}{\text{fluency}}$$

In content analyzing responses for the first and second question, units of analysis were determined by reading each subject's responses. Units of analysis were distinguished based upon words or phrases that communicated a single complete idea. Sentences that contained multiple ideas were not considered as single units of analysis. The researcher counted how many ideas in total were contained within sentences. After determining the total number of ideas contained within the data set, each idea was subjected to an ongoing process of constant comparison in which similar ideas were grouped into categories and dissimilar ideas were used to start new categories. This process of sequential review was repeated several times until all responses within the data set for the first and second question could be categorized. Categories were then named and renamed, defined and redefined in order to consistently assign meaning to each unit of analysis.

[6] To correct for a pollution effect, scores for originality were calculated by adding together points for rare ideas together and then dividing the sum by the total number of ideas contained within the list (i.e., a participants' score for fluency). In this way, a participant who produced a list consisting of a total of 5 rare ideas would earn a higher score for originality (score = 2) than a participant who produced a list consisting of 5 original ideas and 5 common ideas (score = 0.2). In this case the former participant is clearly outperforming the later in terms of novel-idea production because all of the ideas that he or she has created are rare; only half of the ideas of the second participant were rare.

Concluding the content analysis portion of this method, a second coder was recruited to test the researcher's counts for units of analysis, category definitions and ratings for fluency, flexibility, and originality (in the case of the second question). Using the researcher's category definitions and scoring methods, the second coder categorized one quarter of the entire data set for the first two questions. In instances in which the researcher and second coder did not agree on how a unit of analysis should be categorized or scored, category definitions and scoring methods were revised and a new random selection of a quarter of the data was selected to test the coding scheme anew. This process was repeated until the researcher and second coder reached at least 80% agreement on the number of units of analysis for the first and second question, the category definitions for ideas submitted in response to the first and second question, and each participant's ratings for fluency, flexibility and originality.

Statistical Analysis

The present study's first hypothesis was that the ideas produced by participants exposed to phrases related to mindfulness and flow would reflect greater novelty. This would be signaled by scores for novel-idea production that were significantly higher compared to those produced by participants exposed to phrases related to mindlessness and anti-flow. Essentially, participants exposed to phrases related to mindfulness and flow were expected to produce a greater number of ideas, to produce ideas that represented a greater number of categories, and to produce lists that contained a greater number of original (ideas that appeared nowhere else within the dataset; represented by 1% or less of all responses to the task). Conversely, the second hypothesis was that exposure to phrases related to mindlessness and anti-flow would contribute to participants'

producing less novel ideas. Participants in this experimental condition would produce significantly lower scores for novel-idea production; lists containing fewer ideas, fewer categories of ideas, and fewer statistically original ideas.

To test these hypotheses, Two-way ANOVAs were used to compare the effects of presentation of concepts related to mindset (i.e., mindfulness and mindlessness) and psychological state (i.e., flow and anti-flow) to scores for novel-idea production.

In addition to testing the predicted effects of "matched" priming phrases, the effects of "mismatched" priming phrases would be explored. Scores for fluency, flexibility, and originality produced by respondents in the second (mindlessness and flow) and the third (mindfulness and anti-flow) conditions would be compared to responses within the first and fourth conditions. Results indicating increased or decreased novel-idea production would be examined against participants' ratings on scale items measuring mindfulness and timelessness in order to determine whether differences could be attributed to the activation of priming concepts.

CHAPTER 3: RESULTS

The present study sought to determine whether the presentation of phrases associated with peak creativity can have an influence on the likelihood of one producing novel ideas in an open-ended problem-solving task. As outlined in the previous chapter, the present study's hypotheses are as follows:

- **Hypothesis 1**. Ideas produced in response to an open-ended, problem-solving task are more likely to be novel if an individual is primed by words and phrases associated with the combined concepts of flow and mindfulness.
- **Hypothesis 2**. Ideas produced in response to an open-ended, problem-solving task are less likely to be novel if an individual is primed by words and phrases associated with the combined concepts of anti-flow and mindlessness.

In addition to the two hypotheses, the present study sought to consider how words and phrases representing mismatched concepts affected the production of novel ideas. Specifically, the present study posed the following questions:

- **Research Question 1**. What are the priming effects of words and phrases associated with the combined concepts of mindlessness and flow?
- **Research Question 2**. What are the priming effects of words and phrases associated with the combined concepts of mindfulness and anti-flow?

This chapter details the results of the two-by-two, between subjects factorial design experiment that was used to test the present study's hypotheses and explore its research questions.

Participants

The advertisement for the study sought 300 participants. Participants that were qualified for the study met the following four criteria: (a) they were designated by MTurk as "Masters" for producing consistently high-quality work on assignments offered within the system, (b) they were based within the United States, (c) they had received a 95% approval rating for completed assignments, and (d) they had completed at least 500 assignments.

Within the 10-day period that the study was available in the MTurk Marketplace, 309 qualified Human Intelligence Workers elected to start the study. Of the 309 that started the study (providing informed consent), 108 did not complete it. Of the 108 that did not complete the study, 92 only provided informed consent and then provided no answers to any subsequent questions. These 92 participants quit the study upon presentation of the statements intending to activate associations with different mindsets/experiential states. Because of the way in which the questionnaire was designed, it could not be determined which specific set of priming statements each of the 92 participants were presented prior to quitting. Therefore, there was no data available to explore the possibility that priming statements influenced participants quitting the study prematurely. The remaining 18 participants that did not complete the study quit as follows. Three participants did not complete the open-ended problem solving task. Eight participants did not respond to the scale items. Five participants did not provide useable demographic information.

After eliminating the 108 participants who did not complete the experiment, the remaining 201 (N=201) participants were distributed as follows. Fifty-three participants completed the study under Condition 1 (19 female; 34

male), 39 participants completed the study under Condition 2 (23 female; 16 male), 48 participants completed the study under Condition 3 (24 female; 24 male), and 61 participants completed the study under Condition 4 (34 female; 27 male).

The average age of the participants in the study was 38 years old (SD = 2 years). Two participants reported that the highest level of education they completed was "some high school." Nineteen participants reported that the highest level of education that they completed was high school. Seventy-two participants reported having completed "some college." Twenty-eight participants reported having earned an Associate's degree. Sixty-two participants reported having earned a Bachelor's degree. Six participants reported having completed some graduate school. Twelve participants reported having earned a Master's degree. Half of the participants identified as female (n = 100); half identified as male (n = 101). Figure 1 depicts the demographic makeup of all participants in terms of highest level of education completed. Table 4 provides an overview of participants' ages as they were distributed across the four experimental conditions. Table 5 provides an overview of the participants' gender and level of education as they were distributed across the four experimental conditions.

Figure 1: Demographic Makeup of Participants (Education)

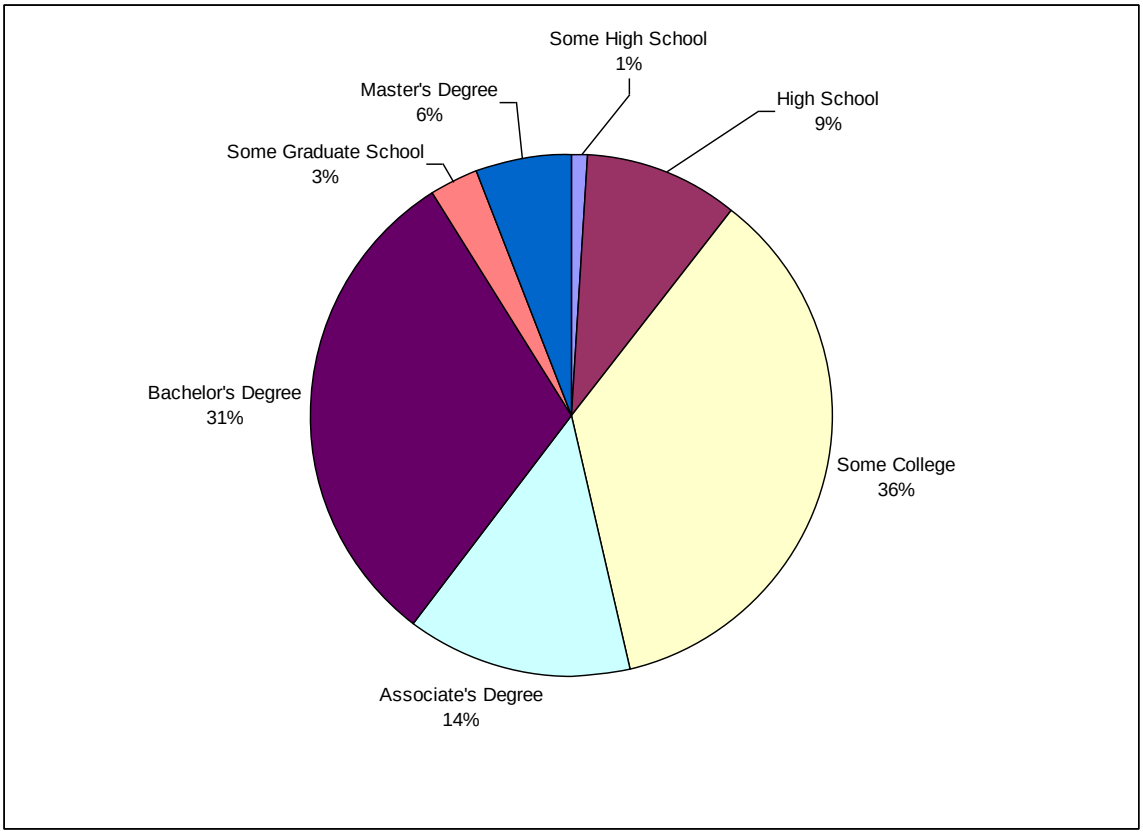

Table 4: Demographic Makeup of Participants (Gender & Age) By Experimental Condition

Condition 1	**Condition 2**
Average age: Female (n=19): 39 (SD = 2) Male (n=34): 37 (SD = 2)	Average age: Female (n=23): 42 (SD = 0) Male (n=16): 35 (SD = 3)
Condition 3	**Condition 4**
Average age: Female (n=24): 42 (SD = 1) Male (n=24): 34 (SD = 3)	Average age: Female (n=34): 41 (SD = 2) Male (n=27): 37 (SD = 3)

Table 5: Demographic Makeup of Participants (Gender & Highest Level of Education) By Experimental Condition

	Condition 1		Condition 2	
Highest Level of Education	**Female**	**Male**	**Female**	**Male**
Some High School	1	0	0	0
High School Graduate	2	2	3	1
Some College	8	17	9	3
Associate's Degree	0	4	5	5
Bachelor's Degree	6	10	5	5
Some Graduate School	2	0	0	1
Master's Degree	0	1	1	1
	Condition 3		**Condition 4**	
Some High School	0	0	0	1
High School Graduate	4	1	5	1
Some College	5	7	11	12
Associate's Degree	4	5	4	1
Bachelor's Degree	8	9	9	10
Some Graduate School	0	1	2	0
Master's Degree	3	1	3	2

Responses to Statements Seeking to Activate Mindset and Psychological State

The Qualtrics system includes a randomization feature that was used to assign participants to one of four different experimental conditions upon starting the study. Each condition was distinguished by the presentation of a different set of statements intended to activate associations with the combined concepts of mindfulness and flow (Condition 1), mindlessness and flow (Condition 2), mindfulness and anti-flow (Condition 3), and mindlessness and anti-flow (Condition 4). After being presented with the statements, participants were instructed to create a brief list of words or phrases that came to mind as they read each one. Participants were given the suggestion, "think of some specific time in which all of these statements were true for you; or, imagine the kinds of circumstances under which all of these things might be true for a person." In creating their lists, participants were asked to provide more than one response (i.e., "a list must include at least two items").

Each participant's lists submitted in response to the statements was subjected to content analysis in an effort to detect the types of thoughts that were activated. Ideas were entered into a spreadsheet created in Microsoft Excel in such a way that each idea could be considered on its own and in comparison to the other ideas submitted in response to the statements. A total of 884 units of analysis were content analyzed. First, each idea was considered independently, irrespective of the experimental condition in which it was produced and the other ideas provided in the participant's list. Ideas were assigned initial category labels that attempted to capture the types of thoughts and/or behaviors that were activated by the statements. Second, after ideas were independently content analyzed several times, and after initial category labels were subjected to

revision, ideas were considered in the context of the lists where they originally appeared. Category labels were further refined and combined. Definitions for each category were devised and refined. This process was continued until the researcher could consistently use category definitions to categorize each idea produced by participants in response to the statements.

In total, twenty-nine categories emerged from participants' responses to the statements. Table 6 presents these categories along with percentages indicating how frequently ideas representing each appeared within the entire dataset, definitions, and exemplars.

Table 6: Categories of Responses to Priming Statements

Category Name	Definition	Exemplars
Negative Feeling (14%)	Focus upon negative emotions (i.e., sadness, anger, fear); feeling badly about something.	"I felt sad." "Worried about missing out." "Disappointment." "Afraid." "Depression." "Disillusioned about career."
Uncertain (6%)	The experience of uncertainty. Attempting to deal with not knowing what is happening; not knowing what to do.	"I am conflicted." "This person sounds uncertain in life." "I was very confused." "Conflicted." "Unsure of direction."
Focused (6%)	Repeating or paraphrasing the statement, "I'm focused."	"I knew exactly what the goal was." "I always try to remain focused." "I know exactly what to do." "I won't be distracted." "Stay objective." "A time in my life when I know what I want."

Table 6: Categories of Responses to Priming Statements (Continued)

Category Name	Definition	Exemplars
Challenge (6%)	Describes a task or situation as challenging; or, the participant repeats or paraphrases the statement, "I am up to the challenge."	"I know that the road ahead may be hard." "I am trying to prepare myself for a difficult job." "I am about to be tested." "Learning something difficult." "Solving a problem that is complicated."
Resistance to Manipulation (5%)	Reflects awareness of being manipulated (i.e., "I wonder if saying these things out loud will cause me to feel this way?"); or directly contradicts one of the statements intending to trigger associations with mindsets or experiential states. For example, a participant was presented with the statement, "my goals are not clear," and wrote, "my goals *are* clear."	"I can't agree with this." "This is mostly not me." In response to the statement, "I'm not focused," a participant writes, "I always try to remain focused." In response to the statement, "I'm stuck in a boring routine," a participant writes, "never bored."
Relating to Others (5%)	Repeats or paraphrases the statement, "I'm tuned in to how other people feel."	"Caring and aware of the feelings of others." "Listening to the signals I receive from others." "Keep other people in mind." "I feel the pain of everyone." "I am a very caring person."
Positive Personal Qualities (5%)	Focuses on aspects of one's self-concept that are generally considered positive.	"Empowered." "Proactive." "Sharp." "Financially secure." "Tenacious." "Determined."

Table 6: Categories of Responses to Priming Statements (Continued)

Category Name	Definition	Exemplars
Positive Feeling (5%)	Focuses on emotions (or levels of emotional arousal) that are generally considered positive (e.g., joy, excitement, readiness).	"A wonderful sense of contentment." "I am happy to be myself." "I'm on top of my game." "I am cool." "I am confident in who I am." "I feel alive in this moment."
Bored (5%)	Repeats or paraphrases the statement, "I'm stuck in a boring routine."	"I do the same thing every day." "Every day is the same old thing." "Stuck in a rut." "Bored with life." "My life is monotonous." "Trapped."
Work (4%)	Deals primarily with work-related activities.	"Doing chores." "Working at a cell phone call center." "My business." "Doing my job." "Doing housework"
Not Relating to Others (4%)	Repeats or paraphrases the statement, "I'm not tuned in to how other people feel."	"Cut off from the world." "Alone and lonely." "I've not been able to express my emotions to people I care about." "More interested in goals than people or feelings." "I'm feeling out of touch."
Need to change (4%)	Awareness of a need to and/or a desire to change.	"My routine needs a change." "I have to start looking for a new job." "I want to be healthier." "I need direction." "Life isn't working for me and I need to do something about it."

Table 6: Categories of Responses to Priming Statements (Continued)

Category Name	Definition	Exemplars
Change (4%)	Participant focuses on a life changing event.	"When my daughter was born." "When I was moving." "When I first got out of high school." "Starting a new and wanted job." "I accepted a recent promotion."
Not Focused (3%)	Repeats or paraphrases the statement, "I'm not focused."	"I'm not focused when I get up in the morning." "Distracted." "I'm not particularly focused right now." "My mind seems to wander from thought to thought."
Negative Personal Quality (3%)	Focuses upon aspects of self-concept that are generally considered negative (i.e., disorders, limitations, character flaws, etc.)	"Schizophrenic." "This person is indecisive." "Financial trouble." "Addicted to binge gambling."
In Touch with Feelings (3%)	Repeats or paraphrases the statement, "I'm tuned in to my feelings."	"I'm dealing with grief." "I think about why I feel the way I do." "I tune into my feelings through meditation." "Emotional maturity."
Enjoyable Activity (3%)	Deals with non-work and non-school activities; those that are reasonably considered enjoyable.	"Exercising." "Running a marathon." "When I'm on vacation." "When I'm buying presents at Christmas."
Stress (2%)	Focuses on the experience of stress.	"I'm too stressed out." "Under pressure." "Exhausted and overworked."
School (2%)	Deals with school-related activities/experiences.	"Attending classes." "Studying for school." "Freshman year of college."
Loss (2%)	Focus on the loss/termination of a relationship.	"When my father died." "This friendship is falling apart."

Table 6: Categories of Responses to Priming Statements (Continued)

Category Name	Definition	Exemplars
Helping Others (2%)	Deals with helping others in need.	"Volunteering for an important cause." "Helping patients in need of healthcare." "Donating time/money toward a cause."
Success (1%)	Deals with accomplishment.	"Achievement." "Finishing something."
Not in touch with feelings (1%)	Repeats or paraphrases the statement, "I don't understand why I feel the way I do."	"My feelings are a mystery to me." "Sometimes we don't understand why we feel like we do."
Ambiguous Statements (1%)	Responses submitted by different participants that did not neatly fit into any other category and cannot fit together in a category by any other name. The participants' thoughts reflected by these statements could not be precisely categorized based on the responses themselves or the context in which they were submitted.	"Little voice in my head." "Personal issues." "Money." "Living Arrangements."
Not the Present (<1%)	Deals with focus on the future or past (and does not neatly fit into other categories).	"The future." "I felt like this all of 2011."
Present (<1%)	Deals with focus on the present (and does not neatly fit into other categories).	"Urgency." "The current time in my life."
Not bored (<1%)	Repeats or paraphrases the statement, "I'm not stuck in a boring routine."	"Interesting and fun." "Having exciting choices." "Never bored."
Hope (<1%)	Deals with hopefulness; wishing for something to happen or having faith that it will.	"One of these days, I will find something that will hold my interest and make me think differently." "I call on God in prayer."
Failure (<1%)	Deals with not accomplishing something; being unsuccessful.	"I'm not capable of meeting all of my responsibilities." "I'm too old to start over." "I quit."

Using category definitions presented in Table 6, the researcher considered how the form and content of participants' responses to the first question differed between each of the experimental conditions. Lists of ideas submitted in response to the Condition 1 statements (mindfulness and flow) consisted of an average of five ideas (median = 4; SD = 1). A total of 242 ideas were submitted by participants in response to the Condition 1 statements. These ideas represented the categories of "focused" (15%), "positive personal qualities" (15%), "positive feeling" (14%), "change" (10%), "relating to others," (8%) "challenge" (7%), "enjoyable activity" (7%), "helping others" (5%), "in touch with feelings" (5%), "work" (5%), school (2%), and "success" (2%). Additional categories represented within responses to the condition 1 statements included "negative feeling," "not bored," "present," "stress," "success," (all 1% or less than 1%).

Lists of ideas submitted in response to the Condition 2 statements (mindfulness and anti-flow) consisted of an average of four ideas (median = 4; SD = 0). A total of 152 ideas were submitted by participants in response to the Condition 2 statements. Ideas submitted in response to the Condition 2 statements represented the categories of "negative feeling" (12%), "uncertain" (9%), "challenge" (7%), "negative personal quality" (7%), "work" (6%), "not in touch with feelings" (5%), "not relating to others" (5%), "positive feeling" (5%), "change" (4%), "resistance to manipulation" (5%), "focused" (4%), "enjoyable activity" (3%), "not focused" (3%), "relating to others" (3%), "stress" (3%), "school" (4%), "need to change" (2%), "not the present" (2%), "positive personal qualities" (2%), and "ambiguous meaning" (2%). Additional categories represented within responses to the Condition 2 statements included "failure" "helping others," "in touch with feelings," "loss," "not bored," and "success"

(all 1% or less).

Lists of ideas submitted in response to the Condition 3 statements (mindfulness and anti-flow) consisted of an average of four ideas (median = 4; SD = 0). A total of 197 ideas were submitted by participants in response to the Condition 3 statements. These ideas represented the categories of "negative feeling" (13%), "bored" (11%), "relating to others" (10%), "challenge" (9%), "in touch with feelings" (8%), "uncertain" (8%), "resistance to manipulation (7%), "work" (6%), "focused" (5%), "school" (5%), "need to change" (4%), "change" (3%), "enjoyable activity" (2%), "not relating to others" (2%), and "positive personal qualities" (2%). Additional categories represented within responses to the condition 3 statements included "helping others," "negative personal quality," "not focused," "not in touch with feelings," "not the present," "positive feeling," "stress," and "ambiguous meaning" (all 1% or less).

Lists of ideas submitted in response to the Condition 4 statements (mindlessness and anti-flow) consisted of an average of five ideas (median = 4; SD = 1). A total of 284 ideas were submitted by participants in response to the Condition 4 statements. Ideas represented the categories of "negative feeling" (29%), "bored" (9%), "need to change" (9%), "not relating to others" (9%), "uncertain" (7%), "negative personal quality" (6%), "resistance to manipulation" (6%), "loss" (5%), "not focused" (5%), "failure" (3%), "stress" (3%), and "challenge" (2%). Additional categories represented within responses to the Condition 4 statements included "change," "enjoyable activity," "helping others," "hope," "not in touch with feelings," "not the present," "relating to others," "school," "ambiguous meaning," and "work" (all 1% or less).

Based upon the content analysis of participants' responses to the different sets of statements presented at the beginning of the experiment, the following conclusions were drawn about the types of thoughts that were activated by this part of the experiment. The Condition 1 statements invoked responses that tended to be decidedly positive in tone (e.g., "Nothing can stop me," "I am on my game," and "I am happy with my life"). The content of ideas centered around themes of being focused (e.g., "I will work hard to reach my goals," "I am focused on succeeding," and "I will try my best to accomplish this goal"), successfully dealing with challenges (e.g., "the spotlight is on me," "I'm prepared for a difficult trial," and "I'm ready to confront obstacles"), relating to and/or helping others (e.g., "I can work with my team," "I can talk to anyone," and "I care about people,"), and engaging in both work-related activities (e.g., "doing my job," "being an entrepreneur," and "completing a job at work") and enjoyable activities that occur outside of work (e.g., "when I'm going out for a run," "I'm on vacation," and "on my lunch break").

The Condition 2 and Condition 3 statements invoked a decidedly mixed scope of responses. While a majority of the ideas produced in response to these statements were negative in tone (e.g., "depressed," "troubled," "people are their own worst enemies," "deceitful," and "all hope is lost"), to some extent, these negative ideas were accompanied by some that were also positive (e.g., "this person seems warm hearted," "I'm just as good as anyone else"); however, the inclusion of positive responses to these conditions' statements seemed to represent an exception to the norm. Their inclusion seemed to reflect participants efforts to find "the silver lining" to a "dark cloud." Responses centered on themes including being focused (e.g., "I knew what the goal was," and "this

person only cares about the bottom line") and dealing with challenges ("something unpleasant needs to be done," and "I am trying quite hard to make it work"). There were other responses that centered on themes including dealing with uncertainty (e.g., "I should change, but can't figure out how," "I don't know what to do after college," and "my plans are very unclear right now"), not relating to others ("this person sounds cut off from the world," "I don't read social cues," and "this person doesn't relate to people very well"), and being unfocused (e.g., "I have the attention span of a gnat," "I'm not focused when I get up in the morning," and "I'm focused on nothing"). There were also some responses demonstrating that the Condition 2 and 3 statements caused participants to resist the experimental manipulation, occasionally writing ideas that directly contradicted the specific priming statements (e.g., "this is not me," "this is not true for me," and "many of these statements seem contradictory,"). Statements for conditions 2 and 3 produced a greater diversity of responses than those submitted in response to Conditions 1 and 4.

Responses to the Condition 4 statements were decidedly negative in tone (e.g., "feelings of loss after death," "I lost my job," "my dreams are gone," "this person's children have all moved away from home," and "this person is getting divorced"). They reflected a focus on fractured relationships and the need to change (i.e., to deal with uncertainty, boredom, loss, stress, and failure; e.g., "I was trying to figure out what I wanted to do with my life," "I'm confused from being exhausted and overworked", "being stuck in a job you hate and can't be promoted from," "things were spiraling out of control", and "I quit college"). These statements also appeared to—to some extent—cause participants to resist

the experimental manipulation (e.g., "will saying this out loud cause me to feel this way?" "This is very negative", and "I rarely feel this way").

Novelty of Responses to the Problem-Solving Question

After responding to one of the four sets of statements, all participants were given an open-ended problem-solving task. Participants were instructed to use their imagination to solve a problem; to create a list of interesting, unusual, and clever ideas to solve the problem of people texting while driving. Responses to this question were subjected to a process of open-coding similar to that used in the content analysis of participants' responses to the priming statements. Ideas were entered into a spreadsheet created in Microsoft Excel in such a way that each idea could be considered on its own and in comparison to the other ideas submitted in response to the problem-solving task. A total of 707 units of analysis were content analyzed. First, each idea was considered independently, irrespective of the experimental condition in which it was produced and the other ideas provided in the participants' list. Ideas were assigned initial category labels that attempted to capture the semantic categories of thought that were activated by the problem-solving task. After this process of independent content analysis, and after initial category labels were subjected to revision, ideas were considered in the context of the lists where they originally appeared. Category labels were further refined and combined. Definitions for each category were devised and refined. This process was continued until the researcher could consistently use category definitions to categorize each idea produced in response to the problem-solving task.

Each idea submitted in response to the problem-solving task was placed into one of 59 categories. Following the principles of distinguishing novel ideas

from common ideas (see Torrance 1974), these initial 59 categories were then collapsed into three: common ideas, which represented over 5% of the entire dataset (ideas that were decidedly *not* original because they were offered by so many participants so frequently), unusual ideas (representing 4-2% of the entire dataset), and unique ideas (representing 1% or less of the data-set). Tables 7-9 presents the scope of common, unusual, and original ideas that appeared within participants' responses to the question: how to address the problem of people text messaging while driving.

Table 7: Common Ideas

Sub-Category	Definition	Exemplar
Disable Texting (21%)	Using software, jamming devices, or passive means (i.e., faraday cages), a cell phone is prevented from operating while a person is in a car or while the car is operating.	"Chip blocks texts." "No signal while driving." "An app that turns off texting." "Create a field where phones do not work."
Hands Free (13%)	Using existing hands free features or creating new features to facilitate use of a cell phone without physically touching it.	"Use speech to text." "Create ability to text hands free." "A holder by the steering wheel is voice activated." "The car reads texts aloud." "Something to transcribe and send a response."

Table 8: Unusual Ideas

Sub-Category	Definition	Exemplar
Increase Cost (4%)	Costs of text messaging (i.e., fee per message sent), the cost of auto-insurance, or other costs associated with driving, sending a text message or both are increased.	"Pay a large fee to insurance company." "System keeps track of texting and raises insurance rates." "High fines on people who text while driving."
Turn Off Phone (4%)	As a matter of personal responsibility, people should turn off their cell phones off before driving.	"Turn your phone off so as not to be distracted." "Turn off the phone completely."
Legal (3%)	Create new laws that prohibit texting while driving.	"Should be illegal to text and drive." "Make it illegal for anyone to have a phone in their hands while driving." "Outlaw cell phones with texting capability."
Don't Text (3%)	As a matter of personal responsibility, people should not text while driving.	"People could simply not text while driving." "Do not text." "Ignore your phone."
Tougher Penalties (3%)	Increase the severity of existing penalties for texting and driving (i.e., increase minimum fines/sentences.)	"Stiffer penalties for getting caught." "Make consequences the same as those for DUI." "Harsher punishment everywhere."
Enforcement (3%)	Expand funding for law enforcement or affording officers with greater rights or means to confront people who text while driving.	"Police given authority to confiscate phones." "Have more police monitoring." "Give people tickets." "Provide law enforcement with devices to detect texting while driving." "Have traffic cameras take videos of drivers."

Table 8: Unusual Ideas (Continued)

Sub-Category	Definition	Exemplar
Self-Driving Car (2%)	The development or use of driverless car technology.	"Auto driving cars." "Create a car that drives itself." "Automated cars make people able to text and drive." "Steal Google's self-driving car and spend all the time you want texting."
Another Person Texts (2%)	Having another person who is not driving text message.	"Have a designated texter.'" "Hire an assistant to text for you." "Pay someone to sit in the passenger seat with your phone and dictate your texts."
Advertising Campaign (2%)	Leverage mass media to discourage texting while driving.	"An advertising campaign showing how deadly it is." "PSAs to inform people." "Run advertising campaigns on public transportation."
Unrelated to Problem (2%)	Responses have no apparent relation to the issue of texting while driving (i.e., the participant appeared to list ideas randomly)	"This is theft of intellectual property." "Give Bergdahl back." "Less wars enable the country to have safer technology."
Warning (2%)	Technology built into the cell phone or the car, passive means (i.e., a warning sign stuck to the dashboard) reminds drivers not to text and drive before doing so.	"Loud alarms go off if the phone senses movement." "Flashing lights on the dashboard activate when a cell signal is active." "Your car beeps if it senses a phone near the steering wheel." "SMH app shows texting and driving PSA on opening."

Table 8: Unusual Ideas (Continued)

Sub-Category	Definition	Exemplar
Auto-Reply (2%)	Development or use of software that sends automatic notifications to others (either preemptively or in response to an incoming text message).	"An app that will send text to people they receive texts from while driving." "Auto answers any texts." "Service automatically responds to texts you receive while in the car, letting the person who messaged you know you're unavailable."
Store Phone (2%)	As a matter of personal responsibility, drivers put their cell phones in the glove box, backseat, purse, trunk, etc.	"Keep phone in back seat." "Keep your phone out of reach when you're driving." "Leave your phone in your purse or pocket."
Pull Over (2%)	As a matter of personal responsibility, drivers should pull off the road and park their cars before text messaging.	"Pull over if you need to text someone." "Only use the phone when you have come to a complete stop." "Park and text."
Storage (2%)	The development or use of specialized compartments intended to hold cell phones to prevent their use.	"A lockbox in the back seat." "Lockbox on the outside of the door." "Box you put your phone in that won't open if engine is on." "A locking compartment where they would put their cell phone while in the car."

Table 8: Unusual Ideas (Continued)

Sub-Category	Definition	Exemplar
Training (2%)	Improving existing driver training courses and requirements; expanding training requirements for people to get their licenses that deal with the problem of texting while driving.	"People can go and test drive while texting—like a simulator—where it will show them how easy it is to crash." "Education regarding how driving requires 100% attention." "Dedicate an entire page or so to anti-texting and driving in learners permit manuals."
Disable Phone to Enable Car (2%)	Design cell phones and/or automobiles in such a way that the phone must be disabled in order to make the car work.	"Phone needs to be plugged in to a car outlet which renders it unable to text." "Cars aren't able to be started until a person can prove that their phone is off." "A place in your car that your phone has to be plugged into for your car to start and the phone cant be removed while the car is on."

Table 9: Unique Ideas

Idea Category	Idea Category	Idea Category
Violent Imagery (1%)	The use of graphic disturbing images (i.e., still or moving pictures) as a means of discouraging people from texting while driving.	"Show graphic photos of the death and destruction caused by these avoidable accidents." "Show hard to watch video to teenagers who are just of driving age." "Videos of accidents caused by driving and texting."
Influence Tactics (1%)	Verbal means of influencing others; how one convinces another person to stop texting while driving by using logos/pathos appeals, threats, citing authority figures, etc.	"Show scientific data about texting and driving." "Spread word of the number of accidents attributed to texting while driving." "Jesus never texted and didn't drive a car." "Think of how you can hurt others if you text and drive."
Take Away License (1%)	Licenses should be suspended or revoked for texting while driving.	"License suspension if at fault for an accident caused by texting." "Breaking law results in the loss of your license for up to 5 years." "License revoked if you cause an accident."
Incentives (1%)	Providing incentives (i.e., through insurance companies or cell phone service providers) for not texting while driving.	"Offer reduction at the merchant where cell phones are purchased." "Offer insurance benefits." Discounts on car insurance if you install an app that stops the ability to send a text while your car is on." "Video cameras in the car that go to the insurance company and give discounts for not texting."

Table 9: Unique Ideas (Continued)

Idea Category	Idea Category	Idea Category
Eyes on the Road (1%)	Design improvements to cars or cell phones that encourage drivers to keep their eyes on the road while using cell phones in automobiles.	"A camera senses whether eyes are on a phone or the road." "Monitor eye movement." "Facial detection that can see if eyes are on the road." "A device like XBox Kinetic to detect eye position of the driver. If driving, use beeps if the gaze looks down for more than 4 seconds."
Driving Mode (1%)	As a matter of personal responsibility, set cell phones to a "driving mode" (or equivalent setting; i.e., "airplane mode) in which the phone does not behave in ways that could distract a driver.	"Silence the phone." "Disable your phone for text messages until you're out of your car." "Shut that feature off once the car engine is on."
Display (1%)	Designing cell phones and/or automobiles in such a way that text messages are easier to read while driving (e.g., text messages are displayed on a heads-up display on the windshield).	"Display texts as part of the projected HUD." "Have a panel that is up within the driver's line of sight." "Have a screen in the dash that shows the text." "Make cars that have cellphone screen that shows up in the window."
Alarm (1%)	Active technology that alerts drivers not to text and drive as they are doing so.	"Program the phone so that music that you hate blasts if it senses movement of speeds equivalent to driving." "An alarm goes off in car if texting." "Phone alerts the user when they are behaving like a robotic douche bag."

Table 9: Unique Ideas (Continued)

Idea Category	Idea Category	Idea Category
Prison (1%)	Texting while driving should be punished by mandatory prison sentences.	"6 months jail time." "Jail time for those involved in accidents while texting." "Make driving while texting punishable by 5 years of jail time."
Pain (1%)	Texting while driving should be punished by inflicting physical pain.	"Chopping people hands off." "Shoot rubber non-lethal bullets when people text while driving." "A phone that gives a small electric charge when used in the driver's seat of a car."
In-App Rewards (1%)	Software on the phone rewards users for texting inactivity.	"App that locks the drivers phone while he is driving and gives rewards points for phone inactivity." "App that has a rewards program, where it can tell if you were texting and driving and if you don't you get a point for every mile." Sign up for a don't-text-and-be-rewarded app program where earn small rewards (points per mile, money, etc.).
Hands on the Wheel (1%)	Any statement that deals with designing cell phones and/or automobiles in such a way that a driver's hands must stay on the steering wheel.	"Require both hands for driving." "A touch-sensor in the steering wheel shuts the car off if both hands are not on it." "Implementing texting controls into the steering wheel." "Smart steering wheels. If either hand leaves the wheel then the car sends an alert."

Table 9: Unique Ideas (Continued)

Idea Category	Idea Category	Idea Category
Disable Car (1%)	Designing cell phones and/or automobiles in such a way that the use of the cell phone causes the automobile to stop functioning.	"Car automatically stops if it knows you are texting." "Car turns off its engine and coasts to a stop if a text is sent." "Car won't start unless phone is inside the lock box." "A device that detects an active mobile [phone] within 3 feet of the driver seat – [car] won't start."
Wearable (1%)	Drivers use wearable technology as an alternative to holding a cell phone or touching its controls; or that prevent the use of cell phones while in a car.	"Driving gloves that don't allow texting." "Bluetooth headsets." "The new "Ringly" bracelet like item that is worn on the wrist."
Pledge (1%)	An individual takes a pledge or signs an oath not to text message and drive.	"Take a 'no texting while driving' pledge." "Have kids sign a pledge." "People need to sign an oath not to text and drive." "Make a commitment to others they love that they will not text and drive."
End Texting (1%)	The de-popularization of text messaging; or, removing texting capabilities from future cell phone designs.	"Texting will become obsolete." "Texting should be removed all together." "Get rid of texting completely."

Table 9: Unique Ideas (Continued)

Idea Category	Idea Category	Idea Category
Delay Texting (1%)	Software prevents drivers from receiving text messages when they are sent; text messages are delayed based on whether or not one is driving a car.	"Your phone's GPS notes when you are going too fast to be walking and won't send texts through until a certain amount of time has passed since your last fast movement." "Detects when user is driving and prevents notifications for text messages until destination is arrived." Electronics in the car receives and store text messages, only delivering them once the car is parked."
Call Ahead (1%)	As a matter of personal responsibility, drivers should contact others before driving so they will not need to contact them during a drive or receive text messages.	"Let people know that you are driving and will contact them once you have reached your destination or a safe place." "Tell you friends when you are in your car. Then they won't text back and you won't be tempted to look at your phone." "Make sure you have texted everyone before driving."
Improve Speech-to-Text (1%)	Improving the speech to text interface on cell phones.	"Improve phone to recognize 'textspeak'." "Make voice recognition easier and better." "Create a phone that allows 'textspeak' to be more intuitive."

Table 9: Unique Ideas (Continued)

Idea Category	Idea Category	Idea Category
Tattle (< 1%)	The development of software that enables a cell phone to "tattle" on its user by contacting the police or their parents if a text message is sent while driving.	"Program the phone so that the police are automatically contacted if it senses movement while texting." "Have phones police themselves." "Program the phone so that it contacts parents if teens send or receive texts while driving."
Street Signs (< 1%)	Placing street signs on roadways to remind drivers not to text message.	"No texting signs everywhere." "Have roadside signs that are not being used for other purposes remind people." "Have reminders at certain red lights."
Reminder to Self (< 1%)	The individual reminds himself or herself not to text message (i.e., putting a post it note on the dashboard).	"Paint your fingernails to remind yourself not to text and drive." "Have a note or sticker in the car you can see that reminds you not to text while driving or remind of the consequences."
Public Shaming (< 1%)	Using public shame as a means of deterring people from texting while driving.	"Cell phone provider creates a list of people who text and drive and post that list on the internet for everyone to see." "Shame them publically by putting their name in the local news." "Set cameras up to catch people texting and use those images in public service announcements."

Table 9: Unique Ideas (Continued)

Idea Category	Idea Category	Idea Category
Parental Controls (< 1%)	Parents monitor and restrict how children use text messaging while driving.	"If a minor, have them give their phones to their parents before they go in their car." "Parents can hold the phone until they get home." "Having parents able to 'lock up' phones when they know their child is driving."
Highway Zones (< 1%)	Creating places on the highways (e.g., special lanes) where it is legal for drivers to pull over for the purpose of text messaging.	"Area of the interstate for people to pull over and text." "Make it legal to pull to the far right and text there."
Another Person Drives (< 1%)	Another person drives the car so an individual can text message without putting others in danger.	"Have someone else drive." "People could hire a driver. Then they could text while their driver pays attention to the road." "Hire a chauffeur so you can dedicate all your attention to your texts."
Alternatives to Texting (< 1%)	Using other features on a cell phone to communicate such as telephony (i.e., calling someone instead of sending a text message)	"Call them instead." "Use the telephony feature."
Alternatives to Driving (< 1%)	As a matter of personal responsibility, individuals can use other means of transportation (i.e., a taxi cab or a bus) that allow texting without putting others in danger	"People could take public transportation or a taxi instead of driving themselves." "Buy your own private jet, complete with professional pilot. Your travel time can be spent texting to your heart's content."

Table 9: Unique Ideas (Continued)

Idea Category	Idea Category	Idea Category
Volunteers Discuss Dangers (< 1%)	Credible speakers volunteer to address the problem of texting and driving.	"Have volunteers come to communities to discuss dangers of texting." "Make all drivers attend a meeting of a parent that lost a child due to texting."
Texting Privileges Revoked (< 1%)	Taking away texting privileges	"Impose having texting feature blocked for those caught texting while driving." "Confiscation of phone if caught."
Leave Behind (< 1%)	As a matter of personal responsibility, individuals should not take their cell phones when they drive (i.e., cell phones should be left at home).	"Not taking your cell phone." "Leave the texting at home."
Emergency Only (< 1%)	Texting should only be done in an emergency.	"Only use the phone when there is an emergency on the road." "Ban phone use in cars completely, except in emergencies."
Community Service as Punishment (< 1%)	People who text message while driving should be required to serve the community they endangered.	"Institute service project punishment when an accident involves texting, such punishment to involve janitorial duties in a relevant hospital ward." "Give community service tasks to individuals that are caught texting and driving."

Table 9: Unique Ideas (Continued)

Idea Category	Idea Category	Idea Category
App Lets Friends Know You're Driving (< 1%)	Development or use of software that lets others know where an individual is and if he/she is driving so message senders can choose not to send text messages while one is driving.	"Having phones send a message to let people know you are driving and can't respond. That way people can't get worked up for over not responding." "Create an app that can be sent to friends so they know when you are driving so they will not text."
Timerio (< 1%)	Any statement that deals with the invention of a new, numbers-based language to simplify the composition of text messages.	"Make an official list where numbers mean whole sentences, phrases or ideas that everybody uses."
Telepathy (< 1%)	Any statement that deals with technology (or metaphysical ideas) that allow one to transmit thoughts without text messaging or other conventional means.	"People could have chips implanted in their brains that allow them to mentally communicate with each other."
Self-Destruct (< 1%)	A phone will break if it is used to text message while driving.	"Auto-shatter screen feature for when using phone while driving."
Retrofit Old Cars (< 1%)	Cars without features that prohibit texting while driving can be upgraded or turned in so that new cars with features that prohibit texting can be purchased at a discount.	"Old cars can be retrofitted or turned in for a large discount on the purchase of a new car to fall into line the plan."
Impound Car (< 1%)	Cars of people who text while drive should be taken away.	"Impound the car of the texter."
Forced to Use "Brick Phones" (< 1%)	Punishment for texting while driving is being forced to use a cumbersome, outdated phone from the 1980s instead of one capable of text messaging.	"If you get caught you have to use a cellphone from the 1980s for a year."

Using the categories presented in Tables 7-9, each participant was assigned a score for *fluency* based upon the total number of ideas that were contained within his or her list; a score for *flexibility* based upon the total number of categories that were represented by the ideas contained within his or her list; and a score for *originality* based on the number of unique or unusual ideas within his or her list. Scores for originality were calculated the following way. Participants were awarded a zero for each common idea included in their lists. For each unusual idea included in their lists, participants were awarded one point; for each rare idea, two points. To correct for a pollution effect, scores for originality were calculated by adding together points for rare ideas together and then dividing the sum by the total number of ideas contained within the list (i.e., a participants' score for fluency). In this way, a participant who produced a list consisting of a total of 5 rare ideas would earn a higher score for originality (score = 2) than a participant who produced a list consisting of 5 original ideas and 5 common ideas (score = 0.2). In this case the former participant is clearly outperforming the later in terms of novel-idea production because all of the ideas that he or she has created are rare; only half of the ideas of the second participant were rare. Using these three factors, each participant was assigned a score for novel-idea production using the following formula:

$$\text{fluency} + \text{flexibility} + \frac{\text{originality}}{\text{fluency}}$$

Participants exposed to the Condition 1 statements (mindfulness and flow) received a score of 3.51 for fluency, 2.87 for flexibility, and 0.83 for

originality. Participants' exposed to the Condition 2 statements (mindlessness and flow) received a score of 3.56 for fluency, 3.23 for flexibility, and 1.11 for originality. Participants exposed to the Condition 3 statements (mindfulness and anti-flow) received a score of 3.6 for fluency, 3.29 for flexibility, and 0.98 for originality. Participants exposed to the Condition 4 statements (mindlessness and anti-flow) received a score of 3.46 for fluency, 3.16 for flexibility, and 0.94 for originality. To calculate each participant's overall score for novel-idea production, scores for fluency, flexibility, and originality were added together. Table 10 summarizes these results.

Table 10: Mean Scores for Fluency, Flexibility, Originality and Novel-Idea Production

	Condition 1	Condition 2	Condition 3	Condition 4
Fluency	3.51	3.56	3.6	3.46
Flexibility	2.87	3.23	3.29	3.16
Originality	0.83	1.11	0.98	0.94
Novel-Idea Production	7.21	6.90	7.87	7.56

Responses to Mindfulness and Timelessness Scales

After providing responses to the problem-solving task, participants were presented with a set of 25 statements and asked to indicate on a 5-item, Likert-style scale the degree to which they agreed with each. These statements sought to determine the degree to which the concepts of mindfulness and flow were activated by the statements presented at the beginning of the experiment; to determine whether higher/lower scores for novel-idea production could be reasonably attributed to the experience of states of mindfulness or flow

influenced by the experimental manipulation. Items one through nine were based on the Langer Mindfulness scale (Haigh, Moore, Kashdan, & Fresco, 2010). Higher scores on this scale indicated that participants perceived themselves as more mindful; lower scores indicated participants perceived themselves as more mindless. Items ten to 25 were based on Mainemelis's (2005) scale of timelessness which assessed four dimensions of this construct: immersion, time distortion, mastery, and transcendence. Higher scores for items on this scale indicated participants' perceptions of time to be consistent with the experience of flow (because this psychological state is primarily associated with this experience); lower scores indicated participants' perceptions of time to be consistent with an experience that is antithetical to flow.

Participants' responses to the 25 scale items were averaged for each item (i.e., mindfulness and the four dimensions of timelessness) by experimental condition. Tables 11 and 12 present participants' average responses to scale items.

Table 11: Mean Responses to Mindfulness Scale Items

	Condition 1	Condition 2	Condition 3	Condition 4
I like to investigate things.	4.04	3.82	3.75	3.85
I am always open to new ways of doing things.	3.81	3.59	3.63	3.64
I "get involved" in almost everything I do.	3.81	3.72	3.79	3.69
I am very creative.	3.43	3.28	3.44	3.54
I attend to the "big picture."	3.74	3.62	3.60	3.57
I am very curious.	4.17	4.0	4.00	4.02
I try to think of new ways of doing things.	3.72	3.46	3.35	3.56
I like to be challenged intellectually.	3.85	3.59	3.60	3.77
I like to figure out how things work.	3.92	3.79	3.63	3.57

Table 12: Mean Responses to Timelessness Scale Items

		Condition 1	Condition 2	Condition 3	Condition 4
Immersion	**All my attention is invested in my work.**	3.62	3.85	3.73	3.62
	I concentrate intensely in my work.	3.81	3.90	3.92	3.69
	I am completely absorbed in my work.	3.62	3.62	3.71	3.44
	I am deeply immersed in my work.	3.57	3.59	3.71	3.43
Time Distortion	**I lose track of time.**	3.09	3.18	2.92	2.97
	I feel that time stops.	2.19	2.23	2.13	2.59
	I lose all sense of time.	2.49	2.67	2.42	2.72
	I am not aware of the passage of time.	2.49	2.54	2.46	2.64

Table 12: Mean Responses to Timelessness Scale Items (Continued)

		Condition 1	Condition 2	Condition 3	Condition 4
Mastery	**I feel in command of my work.**	3.79	3.64	3.73	3.74
	I feel in complete control of my work.	3.72	3.56	3.83	3.67
	I get a great sense of control over what I am doing.	3.68	3.54	3.85	3.51
	I have a feeling of mastery.	3.13	3.08	3.33	3.30
Transcendence	**I feel that I am contributing to something larger than me.**	3.04	2.97	3.13	3.33
	I feel that my work is a vehicle for a greater cause.	2.96	2.85	3.10	3.11
	I feel part of a larger purpose.	3.0	2.87	3.31	3.26
	I feel that I am contributing to something larger than my organization.	3.0	2.90	3.06	3.11

Hypotheses and Research Questions

The present study tested the following two hypotheses: Hypothesis 1 stated that ideas produced in response to an open-ended, problem-solving task would be more likely to be novel if an individual is exposed to phrases associated with the combined concepts of mindfulness and flow. Hypothesis 2 stated that ideas produced in response to an open-ended, problem-solving task are less likely to be novel if an individual is exposed to words and phrases associated with the combined concepts of mindlessness and anti-flow. In addition to testing these hypotheses, the present study aimed to explore the effects of exposure to "mismatched" combinations of phrases—specifically, phrases associated with the concepts of mindlessness and flow (Research Question 1) and phrases associated with the concepts of mindfulness and anti-flow (Research Question 2).

Hypotheses

The present study's first hypothesis was that exposure to words and phrases related to the concepts of mindfulness and flow would increase the likelihood of participants producing novel responses to the open-ended problem-solving task—distinguished by statistically significant, higher scores for novel-idea production (the sum of scores for fluency, flexibility, and originality) compared to those produced by participants exposed to phrases related to the concepts of mindlessness and anti-flow. Conversely, the second hypothesis was that exposure to phrases related to the concepts of mindlessness and anti-flow would decrease the likelihood of participants producing novel responses to the open-ended problem-solving task—distinguished by statistically significant lower scores for novel-idea production. Contrasting the present study's

hypotheses, no statistically significant differences were found between participants' scores for novel-idea production in conditions one through four.

A two-way ANOVA was conducted to compare the main effects of mindset priming and psychological state priming and the interaction effect between mindset priming and psychological state priming on novel-idea production scores. Mindset priming included two levels (mindfulness and mindlessness) and psychological state priming consisted of two levels (flow and anti-flow). No effects were statistically significant at the .05 significance level. The main effect for mindset priming yielded an F ratio of $F(1, 197) = .286$, $p > .05$ ($p = .594$), indicating no significant difference between mindfulness ($M = 7.52$, $SD = 2.44$) and mindlessness ($M = 7.69$, $SD = 2.46$). The main effect for psychological state priming yielded an F ratio $F(1, 197) = .211$, $p > .05$ ($p = .647$), indicating no significant difference between flow ($M = 7.61$, $SD = 2.61$) and anti-flow ($M = 7.70$, $SD = 2.31$). The interaction effect was not significant, $F(1, 197) = 2.08$, $p > .05$ ($p = .150$).

Influence of Experimental Manipulation on Mindfulness and Timelessness Scales

No significant differences between scores for novel-idea production across experimental conditions were found. Therefore, it was necessary to test for internal reliability before accepting the null hypothesis. In rejecting hypothesis one and two, the null hypothesis states that activating participants' associations with the concepts of mindfulness and flow (and mindlessness and anti-flow) has no influence on the production of novel ideas. To test the null hypothesis, it was necessary to determine whether statements presented to participants at the outset of the study actually produced measurable differences in the way they responded to the Likert scales for mindfulness and the experience of

timelessness. If participants exposed to statements related to mindfulness and flow responded to mindfulness and flow scale items with ratings that were higher than in other experimental conditions, and if participants exposed to priming statements related to mindlessness and anti-flow responded to mindfulness and flow scale items with ratings that were lower than in other experimental conditions, then there would be some support for the null hypothesis.

Mindfulness scale responses. A two-way ANOVA was conducted to compare the main effects of mindset priming and psychological state priming and the interaction effects between mindset priming and psychological state priming on mindfulness scores. Mindset priming included two levels (mindfulness and mindlessness) and psychological state priming consisted of two levels (flow and anti-flow). No effects were statistically significant at the .05 significance level. The main effect for mindset priming yielded an F ratio of $F(1, 197) = .466$, $p > .05$ ($p = .495$), indicating no significant differences between mindfulness ($M = 33.68$, $SD = 6.15$) and mindlessness ($M = 33.08$, $SD = 6.10$). The main effect for psychological state priming yielded an F ratio of $F(1, 197) = .600$, $p > .05$ ($p = .440$), indicating no significant differences between flow ($M = 33.80$, $SD = 6.61$) and anti-flow ($M = 33.02$, $SD = 5.68$). The interaction effect was not significant, $F(1, 197) = 1.354$, $p > .05$ ($p = .246$).

Timelessness scale responses. To test for differences between scores for timelessness, a series of four two-way ANOVAs were used to examine the effect of presenting participants with phrases associated with different mindsets and experiential states on the four dimensions of this construct (i.e., immersion, time distortion, mastery, and transcendence). First, a two-way ANOVA was

conducted to compare the main effects of mindset priming and psychological state priming and the interaction effects between mindset priming and psychological state priming on immersion scores. Mindset priming included two levels (mindfulness and mindlessness) and psychological state priming consisted of two levels (flow and anti-flow). No effects were statistically significant at the .05 significance level. The main effect for mindset priming yielded an F ratio of $F(1, 197) = .353$, $p > .05$ ($p = .553$), indicating no significant differences between mindfulness ($M = 14.83$, $SD = 3.14$) and mindlessness ($M = 14.48$, $SD = 3.39$). The main effect for psychological state priming yielded an F ratio of $F(1, 197) = .123$, $p > .05$ ($p = .726$), indicating no significant differences between flow ($M = 14.76$, $SD = 3.28$) and anti-flow ($M = 14.56$, $SD = 3.26$). The interaction effect was not significant, $F(1, 197) = 1.664$, $p > .05$ ($p = .199$).

Second, a two-way ANOVA was conducted to compare the main effects of mindset priming and psychological state priming and the interaction effects between mindset priming and psychological state priming on time distortion scores. Mindset priming included two levels (mindfulness and mindlessness) and psychological state priming consisted of two levels (flow and anti-flow). No effects were statistically significant at the .05 significance level. The main effect for mindset priming yielded an F ratio of $F(1, 197) = 2.164$, $p > .05$ ($p = .143$), indicating no significant differences between mindfulness ($M = 10.09$, $SD = 2.78$) and mindlessness ($M = 10.80$, $SD = 3.58$). The main effect for psychological state priming yielded an F ratio of $F(1, 197) = .002$, $p > .05$ ($p = .961$), indicating no significant differences between flow ($M = 10.41$, $SD = 3.16$) and anti-flow ($M = 10.47$, $SD = 3.27$). The interaction effect was not significant, $F(1, 197) = .500$, $p > .05$ ($p = .480$).

Third, a two-way ANOVA was conducted to compare the main effects of mindset priming and psychological state priming and the interaction effects between mindset priming and psychological state priming on mastery scores. Mindset priming included two levels (mindfulness and mindlessness) and psychological state priming consisted of two levels (flow and anti-flow). No effects were statistically significant at the .05 significance level. The main effect for mindset priming yielded an F ratio of $F(1, 197) = 1.458$, $p > .05$ ($p = .229$), indicating no significant differences between mindfulness ($M = 14.52$, $SD = 2.97$) and mindlessness ($M = 14.06$, $SD = 3.01$). The main effect for psychological state priming yielded an F ratio of $F(1, 197) = .915$, $p > .05$ ($p = .340$), indicating no significant differences between flow ($M = 14.10$, $SD = 3.18$) and anti-flow ($M = 14.44$, $SD = 2.83$). The interaction effect was not significant, $F(1, 197) = .002$, $p > .05$ ($p = .966$).

Fourth, a two-way ANOVA was conducted to compare the main effects of mindset priming and psychological state priming and the interaction effects between mindset priming and psychological state priming on transcendence scores. Mindset priming included two levels (mindfulness and mindlessness) and psychological state priming consisted of two levels (flow and anti-flow). No effects were statistically significant at the .05 significance level. The main effect for mindset priming yielded an F ratio of $F(1, 197) = .038$, $p > .05$ ($p = .846$), indicating no significant differences between mindfulness ($M = 12.28$, $SD = 3.79$) and mindlessness ($M = 12.34$, $SD = 3.23$). The main effect for psychological state priming yielded an F ratio of $F(1, 197) = 3.337$, $p > .05$ ($p = .069$), indicating no significant differences between flow ($M = 11.82$, $SD = 3.55$) and anti-flow ($M =$

12.72, SD = 3.44). The interaction effect was not significant, $F(1, 197) = .388$, $p > .05$ ($p = .534$).

In summary, tests for internal reliability revealed that target mindsets and psychological states were not primed. Thus, the present study cannot provide support for the null hypotheses (i.e., there is no relationship between mindset and psychological state priming and novel-idea production) because no evidence can be provided showing that mindset or psychological state priming actually occurred.

Research Questions: Do "Mismatched" Primes Affect Novel-Idea Production?

The present study sought to determine how the presentation of "mismatched" statements relative to mindset and psychological state affected the likelihood of participants producing novel ideas in response to an open-ended problem-solving task. How would participants' scores for fluency, flexibility, and originality be differently affected by exposure to phrases associated with mindfulness and anti-flow, and mindlessness and flow?

The present study found no measurable differences in participants' self-reports of the experience of mindfulness and timelessness; and scores for novel-idea production, drawing conclusions regarding the effects of the presentation of mismatched statements on novel-idea production is unwarranted.

Summary

Responses to Priming Statements

Participants' responses to the statements presented at the outset of the experiment suggest that these stimuli invoked thoughts that were somewhat consistent with the concepts they were intended to activate. The experience of flow is often associated with the joy that comes with immersion in a challenging,

yet rewarding activity. Mindfulness is routinely related to interpersonal skill and being "other-oriented." The general positivity reflected in responses to the statements in Condition 1 resonates with these characterizations of flow and mindfulness. The general negativity reflected in responses to the statements in Condition 4 resonated with the characterizations of experiences that are antithetical to the concepts of flow and mindfulness. Additionally, responses to the statements produced by participants in Conditions 2 and 3—while more negative than positive—reflected a mix of responses that seems unsurprising given the seemingly mismatched concepts by the statements presented at the outset to participants assigned to these experimental conditions.

Novel-Idea Production

Despite participant's responses to the initial statements suggesting that intended combinations of concepts (i.e., mindfulness and flow) were activated, the extent to which they were detectible in the novelty of participants' responses to the problem-solving task is lacking. At best, if exposure to the initial statements produced any mindset or experiential state activation, these effects were not sustained through the remainder of the experiment. Participants' scores for novel-idea production (the sum of scores for fluency, flexibility, and originality) and responses to mindfulness and timelessness scales revealed no statistically significant differences across the four experimental conditions.

Inconclusive Results

The present study found no support for its hypotheses, nor support for null hypothesis. As such, the present study cannot provide support for the premise that exposure to words and phrases associated with different mindsets (i.e., mindfulness and mindlessness) and experiential states (i.e., flow and anti-

flow) influence the likelihood of one producing novel solutions to an open-ended problem. At the same time, the present study cannot provide support for the implication that there is no relationship between the likelihood of novel-idea production and the activation of concepts related with mindfulness and flow.

In conclusion, the present study determined no significant relationships between workplace creativity, priming, and the relationship between these phenomena.

CHAPTER 4: DISCUSSION

The present study deviated from the organizational communication literature's focus on overt interventions to enhance employee creativity (i.e., imposing structures and communication rules, leadership strategies, and technology) and considered how thoughts and behaviors related to novel-idea production may be tacitly activated through one's exposure to verbal stimuli. Specifically, can one's exposure to words and phrases associated with peak creativity affect the likelihood of one producing novel ideas in an open-ended problem-solving task? The present study sought to explore the idea that priming combinations of concepts associated with mindset (i.e., mindfulness and mindlessness) and psychological state (i.e., flow and anti-flow) affect the likelihood of one producing novel ideas. The following hypotheses were posed:

- **Hypothesis 1.** Ideas produced in response to an open-ended, problem-solving task are more likely to be novel if an individual is primed by words and phrases associated with the combined concepts of flow and mindfulness.
- **Hypothesis 2.** Ideas produced in response to an open-ended, problem-solving task are less likely to be novel if an individual is primed by words and phrases associated with the combined concepts of anti-flow and mindlessness.

In addition to considering how words and phrases associated with peak creativity affect the likelihood of novel-idea production, the present study sought to explore how combinations of words representing mismatched priming concepts influenced the production of novel ideas. Two research questions were

posed to guide this aspect of the study:

- **Research Question 1**. What are the priming effects of words and phrases associated with the combined concepts of mindlessness and flow?
- **Research Question 2**. What are the priming effects of words and phrases associated with the combined concepts of mindfulness and anti-flow?

If exposure to certain words and phrases enhance (or impede) one's ability to produce novel ideas, organizational communication practitioners may benefit from research into this phenomenon in two ways. First, overt strategies to enhance creativity (i.e., imposing structure/rules, leadership and technology) may be more effective if greater attention is devoted to the message tactics used in their implementation and use. For instance, in implementing a strategy such as brainstorming rules at the beginning of a meaning, a manager may incidentally and unobtrusively interject phrases that trigger associations with flow—or avoid the use of language that is likely to trigger associations with anti-flow (i.e., "let's tend to this boring out of the way!). Second, in the absence of overt strategies to enhance creativity, organizational practitioners may monitor and impose controls on what meanings are perceived by employees in the work environment that reify organizational structures (i.e., norms) and shape thought and behavior leading to opportunities for creativity. Generally speaking, an enhanced understanding of how words and phrases trigger associations with peak creativity might lead organizational practitioners to better design work environments, to filter in or filter out messages that allow employees to more readily seize opportunities for creativity.

A two-by-two, between subjects factorial design was used to experimentally test this study's hypotheses. Participants were randomly assigned to one of four experimental conditions:

- Condition one attempted to prime the concepts of mindfulness and flow by asking participants to read aloud a set of phrases that were related to the experience of these concepts (i.e., "I'm focused," "my goals are clear," "I'm tuned in to my feelings," "I'm up to the challenge at hand," "I understand why I feel the way I do," "I'm not stuck in a boring routine," and "I'm tuned in to how other people feel").
- Condition two asked participants to read aloud phrases related to the experience of mindlessness and flow (i.e., "I'm not focused," "my goals are clear," "I'm not tuned in to my feelings," "I'm up to the challenge at hand," "I don't understand why I feel the way I do," "I'm not stuck in a boring routine," and "I'm not tuned in to how other people feel").
- Condition three asked participants to read aloud phrases related to the experience of mindfulness and anti-flow (i.e., "I'm focused," "my goals are not clear," "I'm tuned in to my feelings," "I'm not up to the challenge at hand," "I understand why I feel the way I do," "I'm stuck in a boring routine," and I'm tuned in to how other people feel").
- Condition four asked participants to read aloud phrases related to the experience of mindlessness and anti-flow (i.e., "I'm not focused," "my goals are not clear," "I'm not tuned in to my feelings," "I'm not up to the challenge at hand," "I don't understand why I feel the way I do," "I'm stuck in a boring routine," and "I'm not tuned in to how other people feel").

After being presented with combinations of statements intended to prime associations with mindset (i.e., mindfulness or mindlessness) and psychological state (i.e., flow or anti-flow), participants were directed to create lists of words or phrases in response; to describe circumstances when all of the statements were true for the participant—or to think of a circumstance when all of the statements would be true for an individual. Second, participants were given an open-ended problem-solving task. Participants were asked to generate as many interesting, unusual, and clever ideas as possible to deal with the problem of people text messaging while driving. Third, to determine the extent to which the effects of the priming statements activated their intended combinations of concepts, participants provided self-reports using Likert scales for mindfulness and timelessness (a key experiential dimension of flow).

Results of the present study were largely inconclusive. Participants' initial responses to statements intended to prime concepts associated with mindset and psychological state suggested that associations with intended concepts may have been momentarily activated. Lists generated by participants in response to the condition one phrases resonated with the concepts of mindfulness and flow; lists generated by participants in response to the condition four phrases resonated with the concepts of mindlessness and anti-flow. Lists generated by participants in response to the condition two and three phrases demonstrated, in some cases, that one of the two mismatched concepts was activated; in some other cases that both concepts were activated. However, despite some indicators that associations with mindsets and psychological states were momentarily activated, these effects were not sustained as participants completed the remainder of the experiment. Comparing responses between experimental conditions, no statistically

significant differences were found between participants' self-reports on experiences of mindfulness or timelessness. Additionally, there were no statistically significant differences between participants' scores related to novel-idea production. As such, the present study's inability to produce measurable evidence of priming confounded the possibility that data gathered from responses to the open-ended problem-solving task could serve as support for null hypotheses. As the present study was unable to empirically demonstrate the activation of mindfulness and flow, it was subsequently unable to provide support for the contention that activation of these concepts affects the likelihood of one producing more or less novel ideas in response to an open-ended problem-solving task.

This final chapter reflects critically on the inconclusiveness of the present study's results. Consideration is given to whether results may be attributed to underlying assumptions regarding the nature of creativity, priming, or the relationship between these phenomena; methodological problems; and delimitations that were beyond the scope of what could be controlled by the researcher. Following this discussion, directions for future research are outlined. This chapter concludes with a discussion about the implications of investigating the notion that novel-idea production can be enhanced through priming; of the potential benefits and opportunities that may be realized to organizational communication and creativity scholars.

Limitations

The aim of experimental research is to determine the nature of phenomena through the process of forming hypotheses and testing them through structured observations. According to Baxter and Babbie (2004), the communication

researcher approaches a phenomenon—in this case, novel-idea production—and poses the question: can a specific outcome be attributed to the presence (or absence) of a specific input (i.e., can the presentation of certain words and phrases cause one to produce more or less novel ideas in response to an open-ended, problem-solving task)? The researcher's goal is to answer this question conclusively—gathering data as a theoretical model is tested and retested. Assumptions are drawn and redrawn about the nature of a phenomenon, ultimately leading to the development of theory that affords the ability to predict and explain experiences. While the present study failed to produce support for its hypotheses it may, nevertheless, provide value to organizational communication and creativity scholars if careful consideration is given to the question of why such inconclusive results occurred. As such, this section of the chapter critically considers how the present study's results may be a function of conceptual and methodological problems, and factors that may be more rigorously controlled in future studies.

Conceptual Problems

The relative importance of mindfulness and flow. The importance of mindfulness and flow, as contributors to novel-idea production, may have been overestimated. While extant works clearly depict these experiences as essential ingredients to overall creativity, the present study narrowed its focus on how associations with mindset and psychological state influence the production of novel ideas, a part of creativity that fits primarily within the "response generation" stage of the creative process (see Amabile, 1996). Amabile (1996) argues that this stage of the creative process is facilitated by both creativity-relevant processes and task motivation. Considering that domain-relevant skills

(which include the ability to anticipate how a domain's gatekeepers might judge the appropriateness of an idea) are not implicated in this stage according to Amabile's (1996) model, mindfulness may not actually play a major role in determining whether an individual produces more or less novel ideas.

With respect to the novel-idea production focus of the present study, flow may play a more important role than mindfulness. Following Amabile's (1996) componential model of creativity, what was asked of participants—to attend to a problem and generate many novel ideas—would seem to be enhanced by triggering associations with flow. Triggering associations with either mindfulness or mindlessness might have detracted participants from engaging the task at hand in a way that is driven by intrinsic motivation and that relies upon cognitive skills such as lateral thinking (see de Bono, 1967). Ultimately, the present study may have been improved if assumptions regarding the equal importance of concepts associated with mindset and psychological state relative to novel-idea production were tested before considering whether priming either concept ha an influence on the response generation stage of the creative process.

Can associations with mindsets and psychological states be primed? Priming scholars argue that there may be no limit to the scope of what can be primed or the means by which priming effects may be triggered (see Bargh, 2006). However, the inability of the present study to activate mindsets (i.e., mindfulness and mindlessness) and psychological states (i.e., flow and anti-flow), brings the scope of what can be primed into question. While it may be entirely possible to present stimuli that invokes thoughts about the experiential nature of mindfulness or flow, this alone may be insufficient to cause one to actually *experience* either of these states. Indeed, if mindfulness is conceptualized

as one's sensitivity to the form and structure of communication—and heightened attention to the significance of thoughts and behaviors—it may be naive to assume that this state can be activated through priming in the sense of a classical-conditioning-type of response. If one is mindful, it stands to reason that one might be resistant to such efforts as priming to influence thought and behavior. A similar concern may be drawn regarding the assumption that the experience of flow can be activated through priming. While priming stimuli may trigger associations with the experience of flow (i.e., thoughts about the timelessness of an enjoyable experience) this alone may be insufficient to cause one to enter such a state of focused attention. As Csikszentmihalyi (1996) argues, to enter the state of flow, one must first find motivation within to engage a challenging task.

Beyond the present study's assumptions regarding the possibility that associations with mindfulness and flow can be primed—and that these associations might lead one to actually experience these states—the notion that these concepts may be primed simultaneously may also be problematic. Results of the present study beg the question: to what extent is it possible to activate combinations of concepts through priming?

If it is not possible to simultaneously prime associations with mindset and psychological state, perhaps the combinations of the concepts considered by the present study (i.e., mindfulness and flow, mindfulness and anti-flow, mindlessness and flow, and mindlessness and anti-flow) may be better represented by a single word or phrase. For example, instead of trying to prime associations with both mindfulness and flow by a set of terms representing each of these concepts, one might be primed to think about both mindfulness and flow through a set of phrases that each represent the concept of "confidently

competent" (an idea that many responses to the condition one priming statements might have been categorized by). This line of thought draws attention to the potential scope of experiences that constitute prototypical combinations of mindfulness and flow, mindlessness and anti-flow, etc., and how the variety of ways thoughts and behaviors might be activated by exposure to these concepts.

Can creativity be primed? Creativity is fundamentally about producing something that is novel and appropriate. In the workplace, opportunities for creativity tend to be pursued with a degree of emphasis placed on the appropriateness of ideas developed to solve problems. Normative pressures of organizational communication tend to create barriers to the pursuit of novelty. To produce something that is novel requires one to resist pressure to conform to habit or custom. As such, it might be accurate to say that when one produces something that is truly novel, one does something that is *unpredictable*. Priming, on the other hand, is fundamentally about triggering *predictable* responses through the tacit presentation of stimuli. If the production of novelty amounts to producing something *unpredictable*, is it reasonable to assume that the production of novelty can be primed? Can the presentation of stimuli *predictably trigger an unpredictable response*? If so, can this phenomenon still be considered priming?

The present study assumed that an aspect of creativity, novel-idea production, could be facilitated if associations with mindfulness and flow were activated through priming. It did not assume a one-to-one relationship between the presentation of mindfulness- and flow-related phrases and participants' novel-idea production efforts. A main assumption was that the presentation of primes associated with peak creativity—the mindset and psychological state attributed to creative achievement—might shape thoughts and behaviors that

lead one to more readily become mindful or experience flow. In turn, these thoughts and behaviors might enhance novel-idea production. Yet in its attempt to prime concepts associated with peak creativity to predictably alter the manner in which participants generated ideas to solve a problem, the object of the present study's focus may not have actually been on phenomenon that neatly fits within either fields of creativity or priming.

Can one prime oneself? The present study over-relied on participants' self-priming. It was assumed that in saying a set of phrases out loud—thereby injecting them into short-term memory—associations with mindset and psychological state would be activated. This reliance on participants to prime themselves represents an oversimplification of how priming works. Had participants been only nominally invested in the task at hand and "going through the motions" of the HIT assignment, saying something without paying attention to it might suffice to self-prime intended concepts. However, given their status as "Master" problem-solvers within the Amazon Mechanical Turk Marketplace, it is unlikely that such limited attention was devoted to the task. Rather than being incidentally and unobtrusively exposed to a verbal stimulus, participants had a set of largely equivocal phrases foisted upon them by their employer (the researcher). Subsequently, it is little wonder that there was no difference in scores for novel-idea production across experimental conditions as even in those conditions where fewer novel-ideas were expected to be produced, the manner in which the HIT was presented most likely prompted participants to engage in sensemaking. This task was not presented in a way that a competent employee was likely to mindlessly react to; to fixate on boredom or an inability to perform.

The assumption that participants could prime themselves represents a clear weakness in the conceptualization of the present study. If priming were to be expected as a result of an action participants were directed to take, the action would need to be far more unequivocal, while invoking targeted concepts in a way that is far more indirect. Moreover, for participants to effectively self-prime—to unobtrusively and indirectly expose themselves to stimuli that activates associations with mindset, psychological state, or creativity—a method relying upon non-verbal signals might be preferable to one relying upon the presentation of words and phrases.

Methodological Problems

While the present study's inconclusive results may be partially attributed to conceptual problems, it is likely that methodological problems played a greater role in contributing to its shortcomings. This discussion provides cautionary direction for the creativity scholar interested in the topic of priming novel-idea production. Carefully attending to each observation may contribute to the design of future studies that produce data from which authoritative claims about the nature of creativity may be drawn.

Participant selection and commitment. The decision to use Masters-level MTurk Workers was born of a desire to ensure that participants who started the study, finished it—and that completed questionnaires would contain responses that represented an earnest effort to respond to questions accurately (i.e., to not list words at random for the novel-idea generation question and to provide only neutral responses to the Likert questions). In hindsight, however, this decision likely contributed to the uniformity of responses to the novel-idea generation question. Given their uniform designation as "master" problem solvers, it may

be unsurprising that there were no statistically significant differences in average scores for novel-idea production across the four experimental conditions. Widening the scope of who may participate in the study to average to below-average problem solvers might have afforded the opportunity to observe whether a method of enhancing novel-idea production actually works on individuals who are more likely to produce unoriginal ideas.

In addition to widening the scope of who was qualified to participate in the study, greater control may have been imposed in selecting participants for the present study. Participants may have been more carefully screened to determine their willingness to complete a problem-solving task before being assigned to experimental groups. An additional benefit of screening participants is that it might be possible to get a baseline measurement of participants' creative abilities and self-perceptions of experiences related to mindfulness and flow to be compared with data gathered later in the study.

The compensation that participants received for completing this study may have also played a role in their commitment to participate. As Amabile (1996) and her colleagues observed, there is a "sweet spot" relative to how creative performance is enhanced or inhibited by the compensation one receives for a task. Too little and too much compensation seem to inhibit creative performance. However, when one is compensated just above what is sufficient to meet one's needs, there appears to be an improvement in one's ability to perform creatively. These observations are consistent with works on the relationship between flow and creativity which argue that peak creativity is largely the result of intrinsic motivation; that extrinsic pressures to encourage creativity (i.e., higher-than-normal pay) or extrinsic pressures that take one's attention away

from a task (e.g., not making enough money to pay the bills) detract one from devoting one's full attention to a task and thus recognize opportunities for creativity. Without having more information about participants, it is unclear whether or not the amount paid was too low or two high to negatively effect motivation. However, participants recruited to test a pilot version of the questionnaire in Qualtrics were initially offered a substantially lower hourly rate than what was paid to the participants who provided data for the present study's analysis. As a result, very few MTurk workers elected to test the initial version of the questionnaire. The amount offered for the study was increased from one dollar to two, and other aspects of the questionnaire were streamlined to increase the effective hourly wage from less than two dollars to the average amount paid to participants ($7.88 per hour). While this improved the rate of recruiting participants, this compensation amount was still probably lower than what was needed to optimize the presentation of extrinsic rewards in ways that facilitate creativity.

Awareness of the experimental manipulation. Because the present study was being conducted as part of a doctoral dissertation, Institutional Review Board policies were observed, requiring the researcher to disclose the goals of the research study to prospective participants. Although nowhere within the recruiting materials nor within the study itself was it revealed to participants that the researcher was attempting to manipulate them experimentally, the requirement for participants to provide informed consent and the overall design of the survey instrument hosted within the Qualtrics system could signal to even a minimally attentive participant that there was some effort on the part of the researcher to produce some change in their thinking or behavior via some

manipulative mechanism. Notably, some respondents even commented on this in their responses to either the priming statements or the problem-solving task. For example, comments appearing in response to the priming statements included, "Will saying this out loud cause me to feel this way?"

The study might have been more effective in producing priming effects if it was designed to further minimize cues suggesting the researcher's intent. Greater effort might have been put into the design of the questionnaire to reduce the likelihood of participants recognizing that they were being studied, and to reduce the likelihood that such awareness resulted in participants putting up their guard.

Problems with the priming task. Beyond the general intent of the study being "telegraphed" to participants, the portion of the study that specifically sought to prime participants should have been designed to more subtlety inject priming concepts into participants' active memory. This is of considerable importance considering the present study's focus on tacitly enhancing workplace creativity. The way the priming statements were presented could not have been more overt. Future efforts to investigate how priming associations with mindset and psychological state and creativity might be served by adapting techniques used in other priming studies such as having participants sort groups of terms (see Dennis, Minas, & Bhagwatwar, 2014), or respond to the presentation of visual stimuli representing the targeted priming concepts (Lewis, Dontcheva, and Gerber, 2011; Friedman, Fishbach, Förster, and Werth 2003). Additionally, to enhance the value of future studies to scholars primarily interested in organizational communication, priming techniques should be designed to unobtrusively and indirectly expose individuals to priming stimuli

contextualized by workplace situations (i.e., overhearing talk over the water cooler, attending to an employee's elevator pitch, or participating in a meeting).

Problems with directions for the priming and problem-solving tasks. Directions within the study might have also been worded in a way that interfered with intended priming effects. For example, in responding to statements intended to prime associations with mindset and psychological experience, participants were given a choice about how to respond: prepare a list of words/phrases based on when the priming phrases were true for you, *or* true for a person. It is possible that in making the choice about responding from one's own point of view or responding from another person's point of view, one's ability to think creatively would be impacted. Responding from another person's point of view—being other oriented—may activate creative thinking more than responding from one's own, "uncreative" point of view.

Additionally, the presentation of the priming statements (particularly those that contained phrases representing mismatched concepts) and the prompt to participants to relate them to their own lives or the life of another person was highly equivocal. Given the way the study had been described to participants at that point—as an investigation of the relationship between language and problem-solving—this task most likely caught participants off guard, heightening their attention to the form and content of meanings within the task. This follow-up task might have been better designed to reduce the likelihood of participants engaging in sensemaking—particularly in those conditions seeking to trigger associations with mindlessness.

The problem-solving task was also flawed in the way directions prompted participants to generate lists of novel ideas. Specifically, in the directions for this

task, participants were directed to "to use…imagination to solve a problem" and "to see how many interesting, unusual, and clever ideas" could be created. With these directions, participants were biased in favor of producing lists that were more novel, even in the experimental conditions in which participants were supposed to be primed to produce fewer novel ideas. An improved set of directions might ask participants, "Create a list of at least two ideas that can solve this problem…"

Problems with measures for internal reliability. Arguably the greatest weakness of the present study was that it was unable to produce statistically significant results demonstrating that any of the concepts it sought to prime were activated. While shortcomings with the method used to prime associations with mindset and psychological state have been discussed, this problem might be further considered in terms of the way data were captured to measure priming effects. First, the twenty-five statements presented to test perceptions of mindfulness and timelessness might have been presented earlier in the questionnaire—immediately after participants were directed to respond to the priming statements. If the priming statements produced their intended effects, it may be just as valuable to capture evidence of this early in the questionnaire. Then, the researcher would at least know that priming concepts were activated when the problem-solving task was initiated.

Second, the twenty-five statements to measure self-perceptions of mindfulness and timelessness were worded in such a way that participants may have thought about their general experiences with these concepts—not their experiences relative to the task they had just completed. Scale items might have

been modified to focus participants' attention on their present experience within the context of the present study.

Third, scale items only measured experiences relative to mindfulness and timelessness. Limiting the scales to focus only on these items was a decision to make sure that participants were not fatigued by the scope of the questionnaire. However, to capture evidence that concepts related to mindset (i.e., mindfulness and mindlessness) and psychological state (i.e., flow and anti-flow) were activated, the study might have been better "tuned" to detect such effects if additional scale items were included.

Delimitations

Moving beyond a focus on conceptual and methodological problems, the inconclusiveness of the present study may also be due to factors that were beyond the scope of the researcher's control. First, the past experiences and "internal anchors" (see Hovland & Muzafer, 1980) that participants brought into the experiment may have shaped responses to priming statements, the problem-solving task, or the study as a whole, in ways that ran counter to the intended goals of the project. For example, if a participant had a loved one who was killed in an auto accident by a driver who was texting on a cell phone, the scope of his or her responses to the study might be quite different from those of the average participant. While it may be desirable to limit the selection of participants to those who have certain types of experiences, doing so may be impractical as the screening process may reveal something to participants regarding the nature of the experiment's manipulation. Additionally, identifying the scope of internal anchors that could influence how individuals participate in a study may be impractical.

Second, the working environment in which participants elected to complete the task was beyond the control of the researcher. Though the present study was experimental in its design, to study the experience of creativity in the workplace, it may be unwise to restrict observations to a sterile laboratory setting as conclusions derived within such a controlled environment may not be applicable to creative behavior "in the wild" where such controls cannot be imposed. Specifically, the researcher could not control for such contextual factors as when participants completed the study (i.e., at morning, noon or night), where participants completed the study (i.e., at home or in an office; alone or in the presence of others), and how the present study was completed with respect to other HITs (i.e., for some participants, the study was the only HIT that they completed in a day; for others, the study was one of dozens of HITs that were completed in a full work day).

Third, in narrowing the present study's focus on the relationship between activating associations with mindsets and psychological states to influence novel-idea production, other aspects of the creative process were not subjected to empirical measurement (e.g., participant's mood, intelligence, locus of control, etc.; see George & Zhou, 2007). It is highly possible that some other variable—or variables—may have had a moderating effect on the likelihood that associations with mindset or psychological state were primed, or that participants' capacities for novel-idea production was facilitated or stifled by the activation of either concept. As Jarboe (1999) observes, scholars' efforts to test how certain variables affect creativity are routinely confounded by the considerable range of other variables that seem to play a role in the unfolding of different stages of this

process. Subsequently, there may be interactions between variables that have yet to be identified.

Suggestions for Future Research

The experience of creativity in the workplace is an important object of scientific inquiry. With a deeper understanding of this phenomenon, organizational communication scholars and practitioners may be better equipped to structure the experience of work in ways that contribute to employees' ability to deal with challenges that fall outside of an organization's assembly rules. By facilitating employees' ability to produce novel ideas when presented with opportunities for creativity, production goals and the demands of stakeholders may be met with greater efficiency, at reduced costs, and in ways that afford individuals greater dignity and opportunities for social responsibility. Institutions may be better designed to empower employees to proactively deal with uncertainty and change born of the complexity and pace of contemporary work environments. Businesses may adopt new communication norms that contribute to the rejuvenation and retention of employees amid fierce competition and the enduring workplace challenges that can wear on one's commitment to a company's goals. Summarily, if the field of organizational communication expanded upon its ability to predict and explain creative phenomena in the workplace, a great deal of good may be realized by organizations on the whole and by the individual employees that populate them.

The present study sought to shed light on a specific aspect of creativity: *novel-idea production*. While creativity is ultimately the production of ideas that are both novel and appropriate, as Finke (1995) argues, the challenge facing most individuals is not producing something that meets the criterion of

appropriateness, but producing something that is unusual, uncommon, and unexpected; something that does not conform to the social scripts and heuristics born of adherence to assembly rules. Employees presented with opportunities to produce something creative balance opposing needs for doing something novel against doing something that is perceived as appropriate (Eisenberg, Goodall, & Trethewey, 2007). Assembly rules—and the implicit norms born of their observance—tend to lead employees to approach problem-solving in ways that favor appropriateness over novelty. Subsequently, employees tend to produce *uncreative* solutions to problems that, while appropriate, are uncreative due to their lack of *novelty*[7]. Competent, ethical employees rarely attempt to solve problems in ways that are intentionally inappropriate. For example, considering the scope of responses to the present study's open-ended problem-solving task, only a fraction of the responses produced in response to the question of how to solve the problem of texting while driving seemed categorically inappropriate. The vast majority of ideas submitted in response to the problem-solving task seemed appropriately focused on the nature of the problem at hand. Only one participant responded to this task in a way that seemed deliberately off topic.[8]

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[7] Finke categorizes these types of uncreative solutions as *conservative realism* and *conservative idealism*. The former occurs when one produces an appropriate solution to a problem that is actionable; the latter occurs when one produces an appropriate solution to a problem that is not actionable. For example, when faced with the problem of floodlights being off because a generator is out of gas, the conservative realism solution to the problem would be to refill the generator with a full can of gas. The conservative idealism solution to the problem would be to attempt to refill the generator with the fumes from an empty gas can.

[8] Only one of the 201 participants who responded to the problem of texting while driving provided a response that consisted entirely of ideas that can be reasonably judged as inappropriate on the basis that they had nothing to do with the problem at hand. Items included in this participant's list were as follows:
1. Kurdistan needs to be established as a sovereign nation.
2. Class action lawsuit against Obama by the business owners of Ferguson.
3. Give Bergdahl back.
4. Push Keystone through.

Even relatively fanciful ideas submitted by participants (e.g., those falling within the category of telepathy and self-destructing cell phones), seem to reflect a reasonable degree of attention to the nature of the problem at hand (i.e., if people could communicate with their minds instead of via text messaging, the problem would go away; if people's phones were likely to self-destruct, people would be less likely to engage in a reckless behavior).

The challenge that the present study sought to confront was to find new ways of shaping the thoughts and behaviors of well-intentioned, competent employees to produce solutions to problems that were more novel—not to get participants to produce responses that were more appropriate. The vast majority of categories of ideas submitted in response to the open-ended problem-solving task *were appropriate*. Most participants submitted ideas fitting in the categories of *disabling texting* and *hands free texting*—ideas which are appropriate, but decidedly mundane based on the frequency with which they appeared within the dataset. Can a task be presented to individuals in such a way that—via the tacit presentation of stimuli—they are emancipated from a fixation on such mundane ways of thinking?

Based upon the conceptual and methodological problems of the present study the following discussion outlines an improved approach to investigating how organizational communication might influence novel-idea production through priming. This discussion poses that the present study's hypotheses and

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5. Continue to pump oil out domestically, keep the Saudis competing.
6. Charge Holder with high treason.
7. Exile Kerry to Northern Iraq or send him back to Vietnam.
8. Turn off the goddamn news
9. Trade Al Sharpton for any American hostage anywhere in the world.
10. Give Elon Musk and Tesla/Space X more free PR/publicity.
11. Ban this politically correct bullshit.
12. Elect Paul, Cruz, or Trump as the next American President

research questions might be revisited after attention is first devoted to (a) refining methods of measuring relevant phenomena, (b) refining methods of priming associations with mindset and psychological state, and (c) incrementally testing assumptions regarding the relationship between mindsets, psychological states, and novel-idea production.

Scale Development and Testing

To determine whether any organizational communication strategy—tacit or overt—has any impact on an individual's mindset or psychological state, appropriate means of measurement need to be developed and tested. Before the present study's hypotheses and research questions may be revisited, a separate set of studies should be conducted to establish norms for scales used to measure mindset and psychological state activation relative to the completion of an open-ended problem-solving task.

Measuring mindfulness. To improve the ability of future studies to detect differences in participants' experiences of mindfulness, the Langer Mindfulness scale (see Haigh, Moore, Kashdan, & Fresco, 2010) should be administered to participants in its entirety following the presentation of an open-ended problem solving task—without attempting to prime associations with mindset or psychological state. Presenting this scale in its entirety would involve the addition of four items that measure mindlessness (omitted from the present study in the interest of reducing participant fatigue). Table 13 presents the Langer Mindfulness Scale in its entirety, distinguishing items that focus on mindfulness and mindlessness.

Table 13: Langer Mindfulness Scale Items

Mindfulness	▪ I like to investigate things. ▪ I am always open to new ways of doing things. ▪ I "get involved" in almost everything I do. ▪ I am very creative. ▪ I attend to the "big picture." ▪ I am very curious. ▪ I try to think of new ways of doing things. ▪ I like to be challenged intellectually. ▪ I like to figure out how things work.
Mindlessness	▪ I am rarely aware of changes. ▪ I am rarely alert to new developments. ▪ I seldom notice what other people are up to. ▪ I avoid thought provoking conversations.

To determine how responses to these scale items are affected by participants' exposure to an open-ended problem-solving task, a test-retest procedure should be used. Participants could first be asked to respond to this scale. Second, participants could be asked to complete an open-ended problem-solving task similar to the one used in the present study. Third, after completing the open-ended problem-solving task, participants would again be asked to respond to scale items.

Measuring flow. The present study did not use a scale to measure flow because such scales seemed similar to those intended to measure mindfulness (e.g., flow scales include items dealing with an individual's focus on goals). A scale to measure timelessness was used in the present study because of the centrality of this experience relative to the flow state. In hindsight, however, not

using a flow scale may have been a missed opportunity. To avoid this shortcoming in a future investigation, a set of scales intended to measure both timelessness and flow should be used. Once again, Mainemelis's (2002) scale measuring the four dimensions of timelessness should be used. Additionally, participants' experiences relative to the broader field of dimensions of flow should be measured. To accomplish this, a scale such as the one developed by Jackson and Marsh (1996) could be used to accomplish this. The scale developed by Jackson and Marsh (1996) measures the experience of flow in terms of eight dimensions: (a) the balance between a challenge and skill, (b) the merging of action and awareness, (c) clear goals, (d) unambiguous feedback, (e) total concentration, (f) sense of control, (g) loss of self-consciousness, (h) transformation of time, and enjoyable experience. Likert scale items encompassing the eight dimensions of flow are presented in Table 14. A test-retest procedure, similar to what was discussed to test how an open-ended problem-solving task influences responses to mindfulness scale items, should be used to test the effects of such a task on timelessness/flow scale items.

Table 14: Flow Scale Items by Jackson and Marsh (1996)

Challenge—Skill Balance
- I was challenged, but I believed my skills would allow me to meet the challenge.
- My abilities matched the high challenge of the situation.
- I felt I was competent enough to meet the high demands of the situation.
- The challenge and my skills were at an equally high level.

Action—Awareness Merging
- I made the correct movements without thinking about trying to do so.
- Things just seemed to be happening automatically.
- I performed automatically.
- I did things spontaneously and automatically without having to think.

Clear Goals
- I knew clearly what I wanted to do.
- I had a strong sense of what I wanted to do.
- I knew what I wanted to achieve.
- My goals were clearly defined.

Unambiguous Feedback
- It was really clear to me that I was doing well.
- I was aware of how well I was performing.
- I had a good idea while I was performing about how well I was doing.
- I could tell by the way I was performing how well I was doing.

Total Concentration
- My attention was focused entirely on what I was doing.
- It was no effort to keep my mind on what was happening.
- I had total concentration.
- I was completely focused on the task at hand.

Sense of Control
- I felt in total control of what I was doing.
- I felt like I could control what I was doing.
- I had a feeling of total control.
- I felt in total control of my body.

Loss of Self-Consciousness
- I was not worried about my performance during the event.
- I was not concerned with how I was presenting myself.
- I was not worried about what others may have been thinking of me.
- I was not concerned with what others may have been thinking of me.

Transformation of Time
- Time seemed to alter (either slowed down or speeded up).
- The way time passed seemed to be different from normal.
- It felt like time stopped while I was performing.
- At times, it almost seemed like things were happening in slow motion.

Enjoyable Experience
- I really enjoyed the experience.
- I loved the feeling of that performance and want to capture it again.
- The experience left me feeling great.
- I found the experience extremely rewarding.

Relating novel-idea production, mindfulness and flow. After having independently tested how mindset and psychological state is affected by the presentation of an open-ended problem-solving task, consideration should be given to whether or not data collected using these scales support notions regarding relationships between novel-idea production, mindfulness, and flow. Is there a correlation between high scores for novel-idea production and ratings for mindfulness and flow? As the present study may have overestimated the importance of mindfulness and underestimated the importance of flow relative to novel-idea production, one might expect that individuals who produce highly novel ideas in response to an open-ended problem-solving task would provide higher ratings for flow; but average ratings for mindfulness. On the other hand, individuals who produce unoriginal ideas would provide not only average-to-low levels of flow, but also possibly higher ratings for mindfulness. As it was discussed earlier within this chapter, novel-idea production seems to be chiefly facilitated by one's capacity to remain deeply focused within a task. While domain-relevant skills (i.e., the ability to attend socio-environmental factors and the people who ultimately judge the quality of one's work) might play some role in novel-idea production, an especially high level of mindfulness might have a limiting effect on one's ability to truly think outside of the box or to remain focused within a challenging task. In the absence of a priming experiment, these contentions should be explored with refined and tested scales.

Priming Creativity

The present study aimed to influence novel-idea production in an open-ended problem-solving task through priming. This aim was most likely not achieved because the method used to prime participants—asking them to read

aloud a set of statements representing different combinations of mindset and psychological state—was neither incidental nor unobtrusive. Additionally, the questionnaire administered to participants included disclosures and cues that revealed the study's true intentions. Following a Weickian approach to understanding barriers to creative problem solving in organizations, the part of the study that aimed to prime participants, and additional sections that aimed to measure novel-idea production, mindfulness, and timelessness may have prompted much more sensemaking than what was acceptable given the nature of what was being experimentally observed. Had the method of priming participants and other design elements of the questionnaire been prepared differently, there might have been greater variation in participants' scores for novel-idea production and scores for internal reliability measures. This section considers how future studies attempting to prime creativity might be better designed.

Incidental and unobtrusive. Concepts associated with peak creativity need to be presented to participants in a way that is incidental and unobtrusive. The method utilized in the present study—having participants read aloud a set of statements without any explanation as to why—was neither incidental nor unobtrusive. Moreover, listing a group of statements related to the operationalization of constructs without any contextual information could have led to the activation of a wide range of random associations beyond those associated with intended mindsets and psychological states.

In future studies, priming stimuli need to be embedded in the questionnaire in a way that blends in with the problem-solving task. Priming stimuli should not be presented as something separate and distinct. An

improved approach might ask participants to engage in roll-playing. For instance, at the outset of the questionnaire, participants could be instructed to "imagine watching a group of co-workers talking in an office." Participants would be presented a set of cartoons. Each cartoon could contain two caption bubbles—one containing a priming statement and another that is blank. Participants could be directed to provide content for the blank caption bubble; submitting the most likely thing they would say in response to the other person.

Using this cartoon/caption method, a new study might—at the outset—present participants with an open-ended problem-solving task; a pre-test to gauge whether the presentation of priming statements presented in the middle of the questionnaire causes differences that may be observed through a similar problem solving task presented at the end. After being presented with a problem-solving pre-test, participants could then be presented with a series of cartoons depicting one person saying a priming statement to another. Within this priming portion of the questionnaire, participants might also be presented with neutral/non-priming cartoons (depictions of people asking mundane questions that are not readily associated with mindset or psychological state). The questionnaire could be designed to present participants with these types of cartoons (priming and non-priming) continuously for a pre-determined span of time (i.e., 15 minutes) or until the participant has created captions responding to all of the available priming statements.

Using a method such as this, both the priming statements and the open-ended problem-solving task appear to participants as a part of hypothetical interpersonal interactions. Priming statements are not foisted upon them in such an obtuse way as was used in the present study—without context or explanation.

Additionally, the open-ended problem-solving task is not presented as something separate from the presentation of primes. Figure 2 depicts several rough approximations of how a cartoon/caption method of priming might appear in a future study. It includes cartoons containing statements intended to prime anti-flow; an example of a neutral statement; an open-open ended, problem-solving task; and directions that would appear as the beginning of the questionnaire.

Figure 2: Cartoons and Directions to Appear in a Questionnaire Intended to Prime Anti-Flow as Part of an Open-Ended Problem-Solving Task

[Directions] Imagine that you are working in an office observing your co-workers talking to each other. You will be presented with a series of cartoons. In each cartoon one of your co-workers is saying something to the other. Your task is to write down what you would be most likely to say in response to the other person.

Disclosing the intent of the study. In addition to improving the priming method itself, a future study needs to be designed in a way that reduces the likelihood that the intent of the study is revealed to participants. A study using the "cartoon caption" method discussed above should not be described to participants in recruiting materials or informed consent documents as a study, "about the relationship between language and the way people come up with ideas to solve problems." A better, more indirect way of describing the study might be, "a study about the way people use language in the workplace." Similarly, within the study, prompts for participants to provide novel ideas in response to a problem-solving task should not bias participants towards focusing on "interesting, unusual, and clever ideas." Additionally, in presenting directions for tasks within the study, participants should not be given choices regarding how to answer questions (i.e., "think of some specific time in which all of these statements were true for you; or, imagine the kinds of circumstances under which all of these things might be true for a person." The presentation of such choices might be more likely to prompt sensemaking. In turn, this is likely to detract from the efficacy of priming techniques—particularly when primes seek to activate *mindlesness*.

Priming mindset and psychological state separately. In developing a refined approach to priming associations with different mindsets and psychological states, separate studies should be employed. Using a refined set of scales that are better tuned to measure the degree to which priming concepts are activated, future studies should aim to demonstrate the activation of one priming target at a time before revisiting present study's attempt at priming both mindsets and psychological states. Taking such an approach may be especially

valuable in refining an understanding about how components of creativity (i.e., task motivation, creativity-relevant skills, and domain-relevant skills) relate to the response generation stage of creativity—especially if it is found that the activation of mindsets affects the likelihood of one producing more or less novel ideas in response to a problem.

Revisiting the Present Study's Hypotheses and Research Questions

The present study developed its hypotheses based upon several assumptions that, while based on the findings of extant literature (i.e., creativity can be primed) were not exhaustively tested. If, through empirical testing, these assumptions are determined to be valid, revised methods of priming and measuring relevant phenomena might be utilized to determine (a) if exposure to phrases associated with the combined concepts of mindfulness and flow enhance novel-idea production, (b) if exposure to phrases associated with the combined concepts of mindlessness and anti-flow inhibit novel-idea production, and (c) how phrases associated with mismatched combinations of mindset and psychological state affect novel-idea production.

In revisiting the hypotheses of the present study, several additional considerations warrant further attention:

1. If support can be found for the idea that priming associations with mindfulness or flow has an impact on *novel-idea production*, future studies might widen their focus to consider other aspects of the creative process that were not investigated by the present study. Specifically, future studies might consider how mindset or psychological state priming influences (a) the appropriateness of solutions to problems, (b) how

participants present ideas before a field's gatekeepers, and (c) how participants respond to gatekeeper feedback.

2. Future studies should test how priming associations with mindset and psychological state influence the creative process as it occurs in teams. For example, can priming strategies affect the likelihood of team members to communicate in ways that overcome team-level barriers to creativity (i.e., groupthink)?
3. Finally, tacit approaches to enhancing creativity should be considered alongside overt approaches to enhance creativity. For example, a future study might consider whether or not the creativity of a group that commits to an approach such as the Delphi method (see Delbec, 1978)[9] is enhanced or constrained by the presence of incidental and unobtrusive stimuli that activate associations with mindset or psychological state. While using an overt approach, can the incidental and unobtrusive presentation of words complement the degree to which such an approach enhances group creativity? Subsequently, future investigations should consider whether attention to the use of tacit strategies alongside overt approaches actually produces insight that is of real value to organizational communication practitioners. Do tacit approaches to enhancing creativity, presented alongside overt strategies produce substantial improvements in terms of creativity, or only marginal differences?

Summary

Results of the present study, while ultimately inconclusive, provide starting points for future explorations of the intersection between novel-idea

[9] This approach to enhancing creativity in groups requires group members to use computer mediated channels to present ideas anonymously.

production and priming. Before drawing new hypotheses regarding the priming of novel-idea production, the methods and instruments used in the present study must be revised and tested. The ultimate contribution of the present study is the development of a research agenda specifying a variety of tasks that must be undertaken before the present study's research questions and hypotheses may be revisited.

Implications and Conclusion

Throughout the tradition of Western thought, the capacity for creativity has been an object of particular wonder (Runco & Albert, 2010). On one hand, the idea of creativity is often associated with imagery of the lonely poet, painter, or musician venturing "unpath'd waters," and "undream'd shores" (Shakespeare, trans. 1870, 4.4.642); losing oneself amidst thoughts inspired by a quasi-magical muse that are beyond the reach of mere mortals. On the other hand, creativity is also associated with conscious, deliberate, *socially-connected* action; when collaborators work together to produce solutions to problems through procedures that put "…new things in old combinations and old things into new combinations" (Weick, 1979, p. 252). This second characterization of creativity may be what comes to mind most when one considers the exemplars of creative achievement over the past century. Innovations in fields like medicine, physics, engineering, and computer science are all as attributable to discourse at the group and organizational level of analysis as they are to the internal cognitions that occur in the minds of individuals working alone.[10]

[10] Introducing their review of organizational network and flow theory, Monge and Contractor (2003) reflect upon the centrality of group work in determining the performance of organizations in an increasingly competitive, global environment.

Understanding the nature of how creativity occurs in organizations has become an object of scientific inquiry among an interdisciplinary field of scholars for over half a century. Facing challenges related to production goals, customer demands, and the needs of employees, creativity in organizations and the ability to cultivate it has emerged as a key quality of organizational effectiveness (Amabile, 1998; Jarboe, 1999). This study sought to contribute to scholarship in this area by investigating whether organizational messages that prime concepts associated with creativity facilitate or inhibit the production of novel ideas to solve problems.

Whenever something is produced that is described as creative, it is a result of a deliberate manner of thinking and behavior; one that involves learning or accessing knowledge that is not readily associated with the context in which a problem emerges—what de Bono (1995) refers to as *lateral thinking*. Moreover, it involves consideration of a wide breadth of possibilities—many of which may ultimately prove incorrect. Yet, as Kanter (1996) argues, as *a thousand flowers bloom*—or, as more novel ideas emerge through one's persistent effort—the likelihood that one will produce something that is both novel and appropriate increases. In short, creativity entails a special effort through which, thoughts and behaviors move from a focus upon "ordinary" ideas (which may be either appropriate or inappropriate), to those which are more unusual, to those which meet criteria to be judged as both novel *and* appropriate (Amabile, 1996; de Bono, 1995; Kanter, 1996).

The present study was chiefly concerned with the nature of novel-idea production as a component of workplace creativity. There are at least two different ways that this aspect of creativity can be observed in this context. On

one hand, novel-idea production can be observed when an employee produces ideas towards the development of new products, services, or ways of doing business. When this aspect of creativity is observed this way, it may constitute the first step of innovation, or the process whereby creative ideas are adopted, modified, implemented, and diffused throughout an organization (Thompson, 2003; Unsworth, 2001; Woodman, Sawyer, & Griffin, 1993). Creativity researchers often characterize these instances of novel-idea production as the initial step of "big-C" creativity.[11]

On the other hand, instances of "little-c" creativity begin with the production of novel ideas that—while not initiating innovation per se—have an important impact on employees' workplace experiences. Solutions to practical day-to-day problems and collaborative resolutions to interpersonal conflicts exemplify instances when there is often a pressing need for novel ideas. The production of novel ideas that characterize little-c creativity may be most readily observed in the ways employees manage workplace relationships through behaviors that seek to surprise, delight, and bring interest to others' lives at work (Bassin, 1986; Boden, 2004; Kaufman & Beghetto, 2009; Kozbelt, Beghetto, & Runco, 2010; Richards, 2007; Runco & Richards, 1997). Types of creativity that occur within the workplace may be further distinguished relative to the circumstances under which the process occurs or the types of creative ideas one produces (i.e., expressive creativity, technical creativity, inventive creativity, etc.; see Hare, 1992). Yet, despite the difference in magnitude of outcomes born of

[11] Dean Keith Simonton, quoted in Kersting (2003, p.40), defines "big-C" creativity as the process whereby one "solves a problem or creates an object that has a major impact on how other people think, feel and live their lives." Little-C creativity, on the other hand, is defined as "the ability to adapt to change" in the context of "everyday problem-solving." These terms appear throughout the creativity literature, used in this way by many different scholars to distinguish those rare instances of creativity that produce innovations from more common instances of that do not.

"Big-C" and "little-c" creativity, and other parameters used to draw distinctions between instances of creativity, creative phenomena in organizations are widely assumed to be the result of a relatively uniform set of interrelated cognitive and behavioral processes (Jarboe, 1999; Unsworth, 2001).

Had the present study produced results to support its hypotheses (or null hypotheses), this final section would be devoted to suggesting ways in which the organizational communication or creativity scholar might apply these findings to the wider sphere of theory and to the experience of work—offering specific suggestions to designing situations in ways that emancipate employees from the tyranny of uncreative patterns of thought. However, with only speculative conclusions at best from which to draw, some additional reflections will be offered about the potential value of this project to serve as a justification for the work that needs to be done.

As scholars have cautioned (see Jarboe, 1999), creativity is an area of inquiry that should not be embarked upon lightly. It is a research area that is rife with opportunities to encounter frustration. As such, it may be an especially beneficial academic exercise for one to cultivate one's creative potential: to consider different ideas, to develop them to present before a field of experts, and *to find ways of sustaining one's intrinsic motivation despite extrinsic pressures to quit and move on to other, more satisfying pursuits*.

But the intersection between creativity and organizational communication nevertheless represents an important and largely underexplored area of scientific inquiry. This importance is underscored by the current state of institutions (i.e., businesses, schools, governments, military forces, religious organizations etc.) which, even to the casual observer, highlight a clear and urgent need for the

development and propagation of new ways of thinking. As such, the search for ways of structuring institutions so that new ideas may be brought into being and brought to bear on problems may represent one of the most important tasks an organizational communication scholar can undertake. Should this area of research produce discoveries that expand our understanding of how creativity works, the *potential implications* are wide-reaching yet equally profound. With a richer understanding of the nature of creativity, we may better equip employees to accomplish such lofty goals as providing the spark that sets off innovations that change the world to such humble goals as helping an individual endure everyday problems that wear on the soul.

APPENDIX: CONSENT FOR PARTICIPATION IN RESEARCH

Title: Language and Problem-Solving

Introduction

The purpose of this form is to provide you information that may affect your decision as to whether or not to participate in this research study. The person performing the research will answer any of your questions. Read the information below and ask any questions you might have before deciding whether or not to take part. If you decide to be involved in this study, this form will be used to record your consent.

Purpose of the Study

You have been asked to participate in a research study about the relationship between language and the way people come up with ideas to solve problems. The purpose of this study is to determine how the use of certain words affects how people think when they attempt to solve open-ended, problem-solving tasks.

What will you be asked to do?

If you agree to participate in this study, you will be asked to complete four sections:

- Section 1: Read a list of 7 statements and then respond by typing a brief list of words or phrases.
- Section 2: Read a short paragraph that outlines a problem and then respond by typing a brief list of potential solutions.
- Section 3: Respond to 25 statements using a scale to indicate whether or not you agree with each one.
- Section 4: Provide answers to three questions; specifically, asking you to volunteer your age, gender, and education.

This study takes between 5 and 15 minutes to complete. This study will include approximately 300 study participants.

What are the risks involved in this study?

There are no foreseeable risks to participating in this study.

What are the possible benefits of this study?
You will receive no direct benefit from participating in this study; however, your participation will help researchers identify practical strategies to help people more effectively solve problems at work and in their personal lives.

Do you have to participate?
No, your participation is voluntary. You may decide not to participate at all or, if you start the study, you may withdraw at any time. Withdrawal or refusing to participate will not affect your relationship with The University of Texas at Austin in any way.

If you would like to participate, indicate your intent to do so by clicking the check box at the bottom of the screen. In doing so, you indicate that you have read this informed consent document and that you understand that you are electing to participate in this research study.

After you indicate that you consent to participate in this research study, you will be directed to a questionnaire.

You may print a copy of this form.

Will there be any compensation?
You will receive $2 (USD). Payments will occur (1) if you provide answers to all questions on the questionnaire; (2) if you follow directions accompanying open-ended questions (i.e., in response to a question asking you to list ideas, you need to come up with more than one idea; a single idea is not a list).

Upon completion of the questionnaire, you will receive a completion code to enter into MTurk to be eligible for payment.

You will be responsible for any taxes assessed on the compensation.

How will your privacy and confidentiality be protected if you participate in this research study?

Your privacy and the confidentiality of your data will be protected by the following methods:

- No questionnaire item will ask you to provide personally identifiable information (e.g., your name, address, social security number, etc.).
- If you volunteer any personally identifiable information unintentionally, it will be deleted by the researcher (this will not disqualify you from receiving compensation for participating).
- Data gathered from this survey will be stored on the Qualtrics.com servers during the data collection period. Access to this data will be limited to the researcher. After the data collection period, data will be transferred to the researcher's computers and stored in password protected files. At this time, data on the Qualtrics.com servers will be deleted.
- All data gathered for this study will be deleted two years after it is collected.
- Conference presentations and published work based on this study will not include any information that personally identifies any participant.

If it becomes necessary for the Institutional Review Board to review the study records, information that can be linked to you will be protected to the extent permitted by law. Your research records will not be released without your consent unless required by law or a court order. The data resulting from your participation may be made available to other researchers in the future for research purposes not detailed within this consent form. In these cases, the data will contain no identifying information that could associate it with you, or with your participation in any study.

Whom to contact with questions about the study?

Prior, during or after your participation, you can contact the researcher, Michael S. Moode at (281) 312-1590 or send an email to Michael.Moode@Lonestar.edu for any questions or if you feel that you have been harmed.

This study has been reviewed and approved by The University Institutional Review Board and the study number is 2014-12-0050.

Whom to contact with questions concerning your rights as a research participant?
For questions about your rights or any dissatisfaction with any part of this study, you can contact, anonymously if you wish, the Institutional Review Board by phone at (512) 471-8871 or email at orsc@uts.cc.utexas.edu.

Participation
If you agree to participate, click the check box at the bottom of this page. You may print this page for your records.

Signature
You have been informed about this study's purpose, procedures, possible benefits and risks, and you have received a copy of this form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time. You voluntarily agree to participate in this study. By clicking the check box at the bottom of this page, you are not waiving any of your legal rights.

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VITA

Micahel Stephen Moode was raised in Downey, California. Moving to Murray, Kentucky in 1993, he graduated from Murray High School in 1995. He then attended Murray State University from 1995 until 2000, and from 2001 until 2003 earning Bachelors of Arts and Masters of Arts degrees in Organizational Communication. In the year that followed, he taught courses in communication at California State University-Fullerton and Chapman University. In the fall of 2005, he entered the Graduate School at the University of Texas at Austin. While pursuing his doctorate, he taught courses in communication at Temple Junior College in Temple, Texas and at Lone Star College-Kingwood in Houston, Texas. He is currently an Associate Professor of Speech Communication at Lone Star College-Kingwood.

E-Mail: Michael.Moode@LoneStar.edu

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